EVALUATIVE TESTING OF 13 SITES ON THE FORT CARSON MILITARY RESERVATION, EL PASO AND PUEBLO COUNTIES, COLORADO

By

Mona Charles, Philip Duke, Randy Nathan
and Christine Markussen

Department of Anthropology
Fort Lewis College, Durango, CO
Cooperative Agreement Number 1443-CA-6000-A9-003

Fort Carson
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In 1999, evaluative testing of 13 archeological sites was conducted by Fort Lewis College on the Fort Carson Military Reservation (FCMR) for the purpose of evaluating the potential of these sites to yield significant information about the prehistory of the FCMR and to better manage its cultural resources. The work was conducted under a cooperative agreement with the Midwest Archeological Center (MWAC), National Park Service. Five of the 13 sites tested are determined to possess the potential to yield significant information under Criterion D and are recommended as eligible for nomination to the National Register of Historic Places (NRHP), and requiring further protective measures. The remaining eight sites are recommended as not eligible for nomination to the NRHP and require no additional archeological work. This report summarizes the results of the testing, which includes detailed information on each site's stratigraphy and material culture. Radiocarbon dates from four sites — three rock shelters and one open site—all recommended as eligible for nomination to the NRHP, confirm a notable prehistoric occupation during the Developmental and Diversification periods of the Late Prehistoric stage for the FCMR.

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PREFACE

The archeological investigations reported in this manuscript are an important part of the Fort Carson Cultural Resources Management Program. The goal of the program is to maintain the largest possible area for military training while protecting significant cultural and environmental resources. Through an Interagency Service Agreement, the National Park Service, Midwest Archeological Center (MWAC), assists Fort Carson in accomplishing its cultural resources goals and meeting its legal obligations. Fort Lewis College completed the reported project under a cooperative agreement with the MWAC.

The current study is part of an integrated plan that takes a long-term systematic approach to meeting identification, evaluation, and resource protection requirements mandated by the National Historic Preservation Act. Beginning in 1978, Fort Carson initiated the development of a model of site locations, which along with knowledge of military land use patterns, would guide efficient and cost-effective inventory of training lands. The project reported here completes the second phase of the archeological inventory program - evaluative testing of archeological sites to determine their National Register of Historic Places (NRHP) eligibility. In addition, the results of this project are a valuable contribution to our knowledge of the prehistory, history, and cultural resources of central Colorado.

The first federally funded archeological survey of Fort Carson began in 1978. Since then, Fort Carson has used a multidisciplinary approach, combining archeological theory and historical methods with geological, geomorphological, botanical, and statistical techniques and procedures in order to focus its efforts to locate, evaluate, and protect significant cultural resources. Professional studies and consultations with Native American tribes have resulted in the identification of National Register of Historic Places eligible sites and districts. The cultural resources on Fort Carson and the Pinon Canyon Maneuver Site represent all major prehistoric and historic cultural periods recognized on the Great Plains and in the Rocky Mountains. Sites of the Paleoindian, Archaic, and Ceramic stages are present as are sites from the Fur Trade era, 19th century Hispanic and Euroamerican settlements, early 20th century homesteading and ranching, and World War II- and Cold War-era military sites.

The Cultural Resources Management Program is in the Directorate of Environmental Compliance and Management (DECAM), which is tasked with maintaining Fort Carson's compliance with federal, state, and local environmental laws and mandates. The DECAM holistic management philosophy holds that all resources

are interrelated. Decisions affecting one resource will impact other resources. The decisions we make today will affect the condition of Department of Army lands and resources for future training, research, and recreation. Mission requirements, training resources, wildlife, range, soil, hydrology, air, and recreation influence cultural resource management decisions. Integrating compliance and resource protection concerns into a comprehensive planning process reduces the time and effort expended on the compliance process, minimizes conflicts between resource protection and use, allows flexibility in project design, minimizes costs, and maximizes resource protection.

Federal laws protect the resources on Fort Carson and the Pinon Canyon Maneuver Site. Theft and vandalism are federal crimes. Protective measures ensure that Army activity does not inadvertently impact significant cultural and paleontological sites. Fort Carson does not give out site location information, nor are sites developed for public visitation. Similar resources are located in the Picketwire Canyonlands, where public visits can be arranged through the U.S. Forest Service, Comanche National Grasslands, in La Junta, Colorado.

Fort Carson endeavors to make results of the resource investigations available to the public and scientific communities. Technical reports on cultural resources are on file at the Fort Carson Curation Facility (Building 2420) and the Colorado State Historic Preservation Office. They are also available through the National Technical Information Service, Springfield, Virginia. Selected reports have been distributed to public libraries in Colorado. Three video programs produced by Fort Carson are periodically shown on Public Broadcasting Stations. Non-technical reports on the prehistory, history, and rock art of southeastern Colorado have been distributed to schools and libraries within the state.

Fort Carson continues to demonstrate that military training and resource protection are mutually compatible goals.

Thomas L. Warren
Director
Directorate of Environmental Compliance and Management
Fort Carson, Colorado
September 2001

POPULAR ABSTRACT

Archeological investigations indicate that the area where the Fort Carson Military Reservation is currently located has been inhabited for about 10,000 years. For most of that period, its inhabitants relied on the local wild plants and animals for their food supply, occasionally making forays into the surrounding plains and mountains for other resources. The arrival of Europeans drastically changed the lifestyles of the American Indians of southern Colorado, who were ultimately forced onto reservations in the nineteenth century. Anglo and Hispanic populations then occupied the area, primarily as farmers and ranchers. In 1942, the U.S. Army acquired the land, which is now used as an army headquarters and training ground. The project described in this report involved the test excavation of 13 archeological sites to determine whether they were eligible for recommendation to the National Register of Historic Places.

TECHNICAL ABSTRACT

In 1999, evaluative testing of 13 archeological sites was conducted by Fort Lewis College on the Fort Carson Military Reservation (FCMR) for the purpose of evaluating the potential of these sites to yield significant information about the prehistory of the FCMR and to better manage its cultural resources. The work was conducted under a cooperative agreement with the Midwest Archeological Center (MWAC), National Park Service. Five of the 13 sites tested are determined to possess the potential to yield significant information under Criterion D and are recommended as eligible for nomination to the National Register of Historic Places (NRHP), and requiring further protective measures. The remaining eight sites are recommended as not eligible for nomination to the NRHP and require no additional archeological work. This report summarizes the results of the testing, which includes detailed information on each site's stratigraphy and material culture. Radiocarbon dates from four sites — three rock shelters and one open site—all recommended as eligible for nomination to the NRHP, confirm a notable prehistoric occupation during the Developmental and Diversification periods of the Late Prehistoric stage for the FCMR.

ACKNOWLEDGMENTS

We sincerely thank our field crew of the 1999 project. Student archeologists included Cody Anderson, Thann Baker, Micah Champagne, Beau Schriever, and Thaddeus (Thad) Swan. Ron Marvin and Forest Frost, from the Midwest Archeological Center, were responsible for the operation and maintenance of the Precision Lightweight GPS Receiver supplied by the Midwest Archeological Center. Forest and Ron aided Randy Nathan, the Field Director, and Mona Charles, co-principal investigator, with the extra responsibilities of their positions. The high-quality artifact illustrations are the work of Nancy Lamm. Beau Schriever's expertise in the use of the Global Positioning System and the associated software, ArcView and AutoCad was invaluable to the success of this project. Sean Larmore volunteered for a day while we were in the field, which provided us with a fresh body to goad.

The project often required packing equipment, including screens, shovels, and a total station, and carrying them cross-county to remote sites on Booth Mountain. In addition to packing this same equipment out and back, we had the additional job of packing dirt from control samples back as well. At no time did the crew complain. We greatly appreciate their effort and acknowledge them for their labors and good spirits.

We owe a special debt of gratitude to Melissa Connor, Midwest Archeological Center, for her assistance in helping us organize the project and for acting as a liaison with Army personnel. We thank Mr. Barry of Range Control for keeping us out of harm's way. Vince Schiavitti and Randy Korgel, Office of Directorate of Environmental Compliance and Management, provided us with the necessary technical advice to complete the assigned tasks in a timely and efficient manner. We especially thank Dick Krause for his humor and undying intellectual stimulation, which kept us all on our toes during his stay in our camp. Meredith Matthews from San Juan Community College in Farmington analyzed the macrobotanical remains. Finally, we thank Steve Chomko, of the Office of Directorate of Environmental Compliance and Management, for his commitment to integrating educational needs and values into the management of archeological resources of the Fort Carson Military Reservation.

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CHAPTER 1
INTRODUCTION

Introduction and Background

This report summarizes the results of archeological testing and evaluation of 13 archeological sites by Fort Lewis College (FLC) at the Fort Carson Military Reservation (FCMR) during the 1999 field season. The purpose of this investigation was to evaluate each site's potential to yield significant information on the prehistory of the FCMR as defined in the Cultural Resource Management Plan (CRMP) prepared by Zier et al. (1997). Five of the thirteen sites are determined to possess the potential to yield significant information under Criterion D and are recommended as eligible for nomination to the National Register of Historic Places (NRHP), requiring further protective measures. The remaining eight sites are recommended as not eligible for nomination to the NRHP and require no additional archeological work.

This project was completed under Cooperative Agreement Number 1443-CA-6000-A9-003 between FLC and the Midwest Archeological Center (MWAC) in Lincoln, Nebraska. Mona Charles and Philip Duke served as co-principal investigators, while Randy Nathan was the field director. Ron Marvin from MWAC was present during the first session, but was replaced by Forest Frost, also of MWAC, for the final two sessions.

Project Location

The FCMR is within El Paso, Pueblo, and Fremont Counties in south-central Colorado (Figure 1.1) and encompasses 215 square miles (137,400 acres). The FCMR was established in 1942 and is currently home to the 3rd Armored Cavalry Regiment, the 10th Special Forces Group, the 43rd Area Support Group, and the 3rd Brigade Combat. Under U.S. Army Regulation AR200-4, the installation is required to identify National Register–eligible properties and to allow consideration of potential impacts of federal actions on such properties. Because of the nature of current land- use practices (e.g., mechanized maneuvers, infantry training, artillery training, flight training), there is continuous potential for damage to the cultural resources on the reservation.

Project History

The 13 sites tested are located on 4 U.S.G.S. 7.5' quadrangle maps (Cheyenne Mountain, Pierce Gulch, Stone City, and Timber Mountain [Figure 1.2]). Eleven of the 13 sites are on Booth Mountain, a prominent topographic feature in the southern

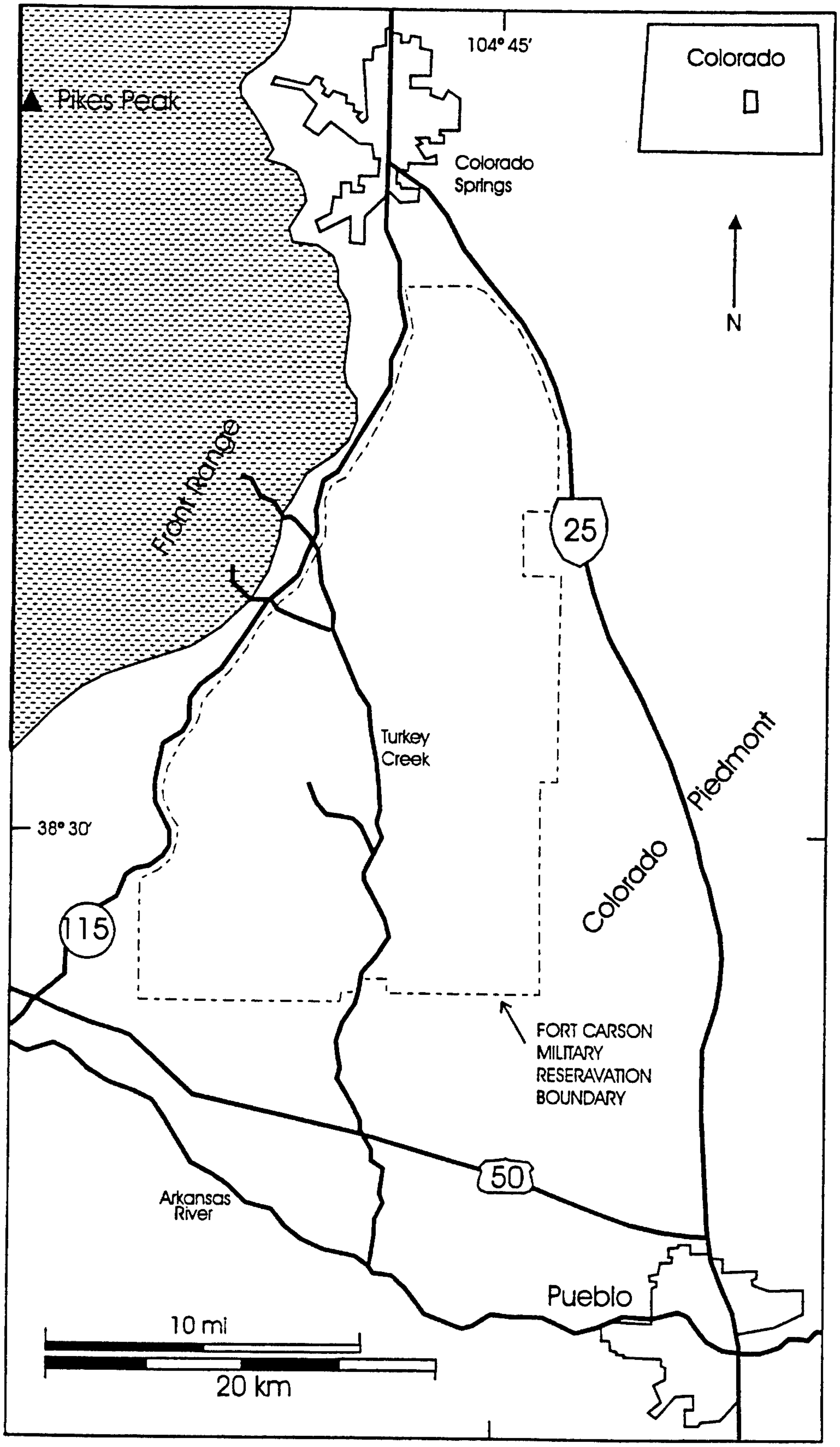
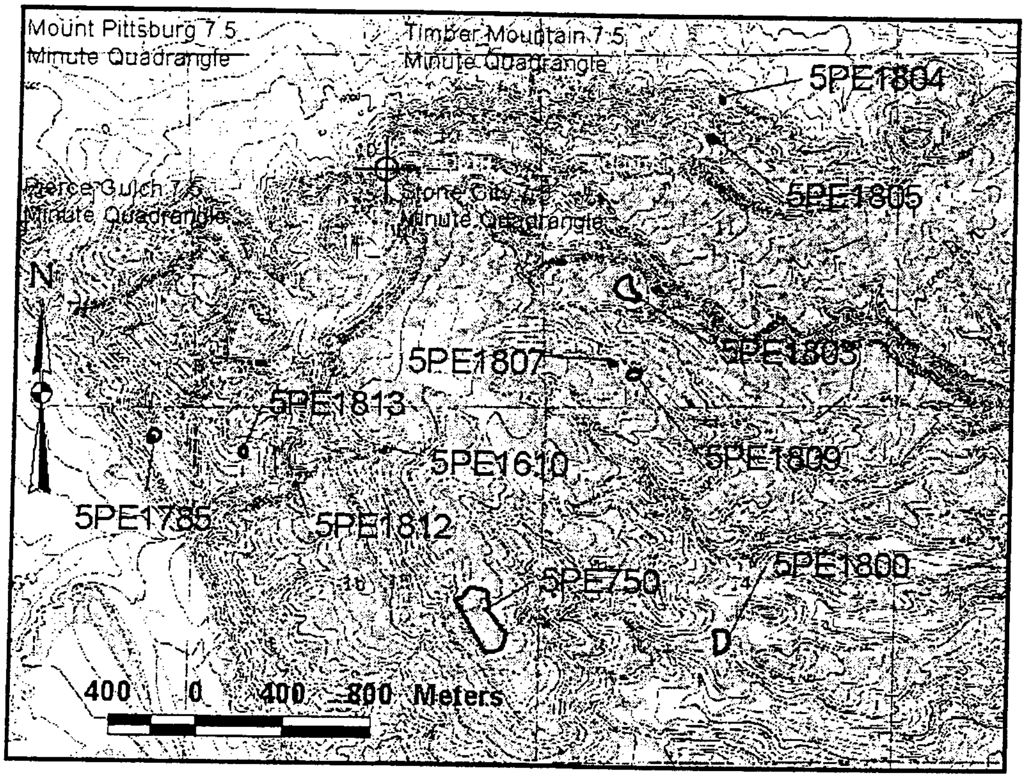
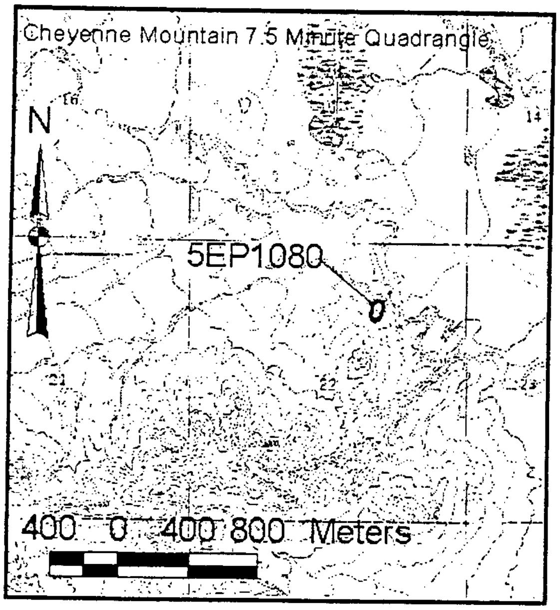


Figure 1.1. Project location map, FCMR, south-central, Colorado. Map adapted from Zier et al.(1996; Figure 1).





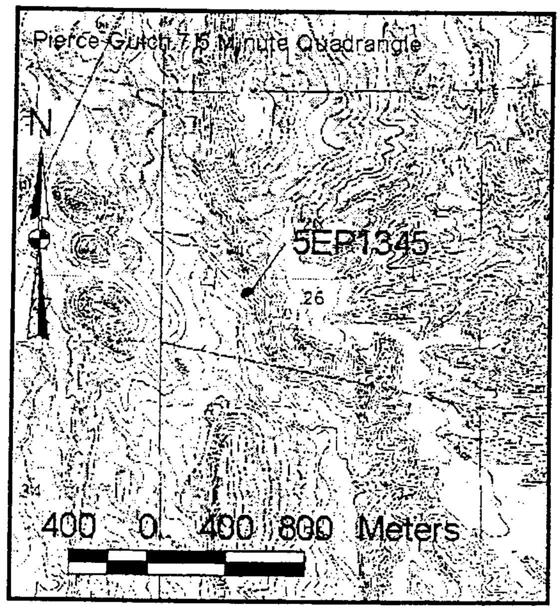


Figure 1.2. Location of evaluated sites, FCMR.

portion of the FMCR; one is within the Little Turkey Creek drainage, and one is on Fountain Creek. Field work at the FCMR included three eight-day sessions, two pre-field days, and one post-field day at FCMR. Field work began on Wednesday, July 13, and ended on August 17, 1999. The crew included six anthropology students from FLC.

The crew began field work for the first session on July 13, and ended on July 21. During the first session, evaluative testing was completed on three sites (5EP1080, 5PE1800, and 5PE1804), and testing was initiated on a fourth site (5PE1805). The second session began on July 27, and ended on August 3. Over the course of the second session, testing and site evaluation was completed for five sites: 5PE1805, 5PE1807, 5PE1809, 5PE1812, and 5PE1813. The third and final session began on August 10, and was completed on August 17. The evaluative testing of five archeological sites was accomplished during that session, bringing the total for the field season to thirteen. The following sites were tested during the third session: 5PE1785, 5PE1610, 5PE1803, 5PE750, and 5EP1345.

Report Organization

Five introductory chapters (including Chapter 1) present the background information for the project. Chapter 2 comprises a discussion of the natural and cultural backgrounds. In Chapter 3, previous research at FCMR that is pertinent to the current project is reviewed. Chapter 4 includes a brief research design that furnishes a context for conducting archeological work at the FCMR, and Chapter 5 provides a description of the field and laboratory methods and techniques employed in this project.

Chapters 6 through 18 then present the individual site descriptions and analyses. Within each of these chapters are found: (1) information on the site setting and previous archeological investigations, (2) description and results of surface inventory and subsurface testing, (3) soil and sediment descriptions, (4) artifact analysis, (5) dating, and (6) interpretive summaries.

Analysis of flaked- and ground-stone artifacts conforms to the standards set in Ahler (1997), Ahler and Smail (1999), Dean (1992), and Sullivan and Rozen (1985). The ceramic analysis was conducted by Richard Krause. Results from the ceramic analysis are presented in the individual site chapters and in Appendix I of this report.

Chapter 19 provides a brief summary of the results of individual site testing and provides management information for the sites recommended as eligible for nomination to the NRHP. Chapter 20 is a brief summary of the project.

Seven appendices complete the report. Appendix I is an analysis of all ceramic

artifacts collected from the FCMR that are housed at the FCMR curation facility. This study, undertaken by Dr. Richard Krause, includes 1,052 ceramic specimens from 56 archeological sites. This study provided a much needed contribution to understanding the greater prehistoric occupation of the FCMR and lends itself to a better management of the cultural resources. It also supplied valuable information to the present undertaking.

Appendix II includes tables for shovel tests completed at each site. Because shovel testing played an integral role in our subsurface explorations, it is appropriate to include these results in their entirety; but because of the large amount of information they contain, they are included as an appendix rather than including them within the individual site chapters.

Appendices III-VI presents quantitative data on the flaked-lithic artifacts, groundstone artifacts, faunal remains, and macrobotanical remains. Appendix VII is a table of radiocarbon results.

Curation

All data and material recovered during this project will be reposited at the Curation Facility at the FCMR.

CHAPTER 2
PHYSICAL AND CULTURAL SETTING

The Natural Environment

Physiography

The FCMR is at the zone of contact between the Plains and the Southern Rocky Mountain physiographic provinces (Fenneman 1931). It is located in the southern part of the Colorado Piedmont of the Great Plains and adjacent to the foothills of the Front Range. This location gives it great elevational range, from approximately 5,600 ft (1,707 m) above sea level (asl) at the reservation's eastern boundary, to 6,500 ft (1,981 m) asl at its western boundary. Five distinct physiographic areas occur in the FCMR: (1) the plains, (2) the low foothills, (3) the high foothill ridges, (4) the valleys within the high foothill ridges, and (5) the high benches (Evanoff et al. 1996).

Geology and Geomorphology The geology and geomorphology of the FCMR are synthesized elsewhere (Charles et al. 1999a, 1999b; Evanoff et al. 1996; Jepson et al. 1992; Kuehn 1998; Madole 1989, 1990; Van Ness et al. 1990; Zier and Kalasz 1991), and the reader is referred to these individual reports for specific details on the local geology and geomorphology.

Bedrock Geology Geologic bedrock of the FCMR is mostly composed of sedimentary rocks ranging in age from Pennsylvanian through Cretaceous (Table 2.1).

Structure The topography of the FCMR is largely the result of uplift, folding, and down warping during the Late Cenozoic when block faulting and uplift were accompanied by volcanic activity over most of the Front Range. Sediments that had eroded from the rising Front Range were carried onto the Great Plains to the east and into intermontane basins to the west (Madole 1990:110). During the Miocene, accelerated uplift resulted in intensive canyon cutting in the mountains and erosion of the softer sediments (Ogallala Formation) from adjoining basins. The Colorado Piedmont, a physiographic entity, was shaped at this time. The Colorado Piedmont is topographically lower than the surrounding regions because the surface was stripped of the Miocene fluvial rocks that cover most of the adjoining Great Plains. In the FCMR, the sedimentary rocks were warped through folding and plunge to the southeast, where they merge with the plains some 20-30 km from the Front Range.

Four anticlines (upwarps) separated by three synclines (downwarps)dominate

Table 2.1. Generalized bedrock lithology, FCMR.

System	Series	Formation	Member	Physical Description
Quaternary	Holocene	Alluvium		Gray, poorly sorted stony sand and silt forming flood plain
	Pleistocene	Landslide debris		Earth flows, debris flows on steep slopes (Holocene and Pleistocene)
		Eolian sands		Fine to coarse windblown sand (Holocene and Pinedale glaciation)
		Louviers alluvium		Thin gravelly deposits on terraces 70' (21m) above streams on plains
		Slocum Alluvium		Weathered gravel on cut surface 100' (30m) above modern streams (Sangamon Interglaciation or Illinois)
		Verdos Alluvium		Weathered gravel on cut surface 200-250' (60-75m) above modern streams (Yarmouth Interglaciation or Kansas Glaciation)
		Rocky Flats Alluvium		Weathered gravel on cut surface 350' (105m) above modern stream (Aftonian interglaciation or Nebraskan glaciation)
		Nussbaum Alluvium		Weathered gravel on pediment 450' (96-108m) above stream (Nebraskan glaciation)
Tertiary	Absent			
Cretaceous	Upper Cretaceous	Pierre Shale		Predominantly siltstone and claystone. Contains sandstone and sandy shale near top and bottom. Limestone masses forming conical buttes near middle, and fossiliferous concretions throughout. Thickness near 3,900' (1,170m)
		Niobrara	Smoky Hill Shale Member	Yellowish-gray, fossiliferous, calcareous shale and silty limestone
			Fort Hays Limestone Member	Beds of chalk 0.15 to 1 m thick separated by beds of dark-gray chalky shale 2.5-52 cm thick
		Carlile Shale	Juana Lopez Member	Calcrete
			Codell Sandstone Member	Upper part is thin lenses of dark limestone interbedded with a limey shale. Basal 0.75 to 1 m is a dense, near-black, fossiliferous limestone
			Blue Hill Shale Member	Dark fissile shale with large calcareous concretions
			Fairport Chalk Member	Tan to black, chalky, calcereous shale
		Greenhorn Limestone	Bridge Creek Limestone Member	Interbedded, fossiliferous limestone and limey shale

System	Series	Formation	Member	Physical Description
Cretaceous			Hartland Shale Member	Light gray limey shale with thin beds of bentonite
			Lincoln Limestone Member	Limey shale with platy limestone beds near base and top
		Graneros Shale		Dark gray to black, fissile, noncalcareous shale, with two beds of dense, dark limestone
	Lower Cretaceous	Dakota Sandstone		Yellowish brown, cross bedded cliff-forming sandstone
		Purgatoire Formation	Kiowa Shale Member	Fossiliferous, marine, dark-gray, claystone, siltstone and sandstone
			Cheyenne Sandstone Member	Massive white to yellowish brown, cross bedded sandstone
Jurassic	Upper Jurassic	Morrison Sandstone		Varicolored claystone, brown weathering sandstone and gray sandstone
		Ralston Creek Formation		Greenish gray claystone, gray limestone with jasper and agate
Triassic		Lykins		Red siltstone, claystone, and sandstone about 180' (55m) thick
Permian		Lyons Sandstone		Red sandstone forming two resistant ledges 700 - 800' (210-240m) thick
Pennsylvanian		Fountain Formation		Red conglomerate and sandstone
			Glen Eyrie Shale Member	Sandstone, sandy shale, and black fossiliferous shale

the landscape of the southwest half of the FCMR. These include three named folds: the Red Creek Anticline, the County Line Syncline, and the Wild Horse Anticline (Evanoff et al. 1996:8-9). A fourth fold, a syncline, remains unnamed. All these folds were compressed in an east–west direction, which produces elongated features with north to north-northwest axial lines. Booth Mountain and Timber Mountain are the topographic expressions of the Red Creek Anticline, while Turkey Creek and Booth Gulch mark the position of the synclines.

Hydrology The major drainages in the FCMR are, from north to south, Rock Creek, Little Fountain Creek, Turkey Creek, Red Creek, and Beaver Creek. The streams in the FCMR drain either to the east into Fountain Creek or to the Arkansas River to the south. An unnamed mesa north of Table Mountain forms part of an upper drainage divide between the Turkey Creek drainage, which flows to the south, and the drainages that flow east into Fountain Creek. This unnamed mesa is the last topographic relief before the flat Plains to the east. Turkey Creek follows the trend of the Turkey Creek Syncline. The Turkey Creek valley was established during the Cenozoic when the ancestral Turkey Creek eroded the fluvial Tertiary rocks until its course was lowered onto the folded Mesozoic rocks. At this point, the stream course took the path of least resistance, eroding into the softer Upper Cretaceous shales and claystones. Eventually the channel was lowered onto resistant Dakota Sandstone. The superposition of the channel onto the eastward-dipping Dakota Sandstone resulted in the formation of Turkey Creek Canyon (Madole 1990:112). Steep sandstone cliffs on both sides of Turkey Creek Canyon provide suitable locations for prehistoric shelters and smooth cliff faces for rock art.

Holocene History The Holocene geological history of the FCMR has not been fully documented. However, generalized Holocene histories are available for the Turkey Creek drainage (Madole 1989, 1990) and for the Red Creek drainage (Kuehn 1998), and these should be referred to for additional detail. Brief summaries of these works are presented below.

Madole (1989, 1990) hypothesized a Holocene history for the Turkey Creek drainage, that is based upon a paleoclimatic model of general atmospheric-circulation experiments and early Holocene paleoenvironmental data from other sites in the region. The alluvial stratigraphy of Turkey Creek was recorded by Madole (1989) for the purpose of providing a geoarcheological setting for the Recon John Shelter. The study is summarized in the following section.

The eastern edge of Booth Mountain is bounded by Turkey Creek, which is superimposed over the eastern axis of the Red Creek Syncline. Madole (1989) identifies three lithostratigraphic units in the Turkey Creek alluvium: a basal gravel unit (Unit 1),

a sand unit that is comprised of two members (Unit 2), and a poorly sorted, gravelly alluvium (Unit 3). Although the precise age of Lithostratigraphic Unit 1 has not been determined, it was probably deposited during the early to middle Holocene. The maximum thickness of the unit is not known, but is commonly as much as 4 m thick. The lower 0.5 to 1.0 m consists of clast-supported, coarse gravels, which may have been deposited during the Pleistocene, but could have been reworked and deposited during the early to middle Holocene. The gravels are mostly pebble to cobble size, with local exposures of boulders ranging in diameter from 25 to 75 cm. Most of the gravels are Precambrian granitic and gneissic rock, and Dakota Sandstone. The intercalated sand and silty beds and lenses are interpreted as having been deposited in or near paleochannels. The basal gravels are conformably overlain by 2.5 to 3 m of poorly sorted clayey and silty sand. The distinctive reddish hue and its coarse, columnar structure distinguish the top of Unit 1 from the bottom of Unit 2. To a large degree, the reddish hue is the result of the parent materials; the sediments are derived mainly from Fountain Formation and Lykins Formation redbeds. A relatively thick but weakly developed soil marks the contact between Unit 1 and Unit 2. This soil consists of an A/C horizon in which the A horizon is cumulative. There is considerable variation in the thickness of the A soil horizon throughout the profile. This variable thickness results from differential soil formation and depositional and erosional influences within the valley floor. In places, the contact between the top of the soil and the overlying Unit 2 is undulating and occasionally marked by stone lines, which suggests a period of erosion after landscape stability but before the deposition of Unit 2. Radiocarbon assays on detrital charcoal from a section near the top of Unit 1 at the Recon John Shelter (Zier et al. 1996) produced ages of 4050 ± 120 BP (Beta 24247) and 4400 ± 80 BP (Beta 24248).

Lithostratigraphic Unit 2 unconformably overlies Unit 1 over most of the valley floor. Unit 2 consists of two subunits: (1) a lower, grayish brown to brown calcareous sand that grades downward to (2) a basal sand. The lower portion of the unit is thicker and more extensive than the upper portion. Typically, the entire unit is less than 75 cm thick, but the stratum ranges from 25 cm along the valley margins to 1.6 m in paleochannels along the valley axis and in small alluvial fans and rills emanating from the valley sides. Well-stratified beds of sand and silty sand are interspersed throughout the unit.

Besides sediments in the lower portion of the unit being generally coarser and better sorted than those in the upper portion and exhibiting slight color differences, the two subunits are distinguished chiefly by the degree of pedogenesis (soil formation). The upper, younger soil is characterized by a A/C profile. The A horizon in the lower soil, although weakly developed, is fairly thick (30 - 40 cm). The younger soil consists only of a thin A horizon (5 - 6 cm), has little to no pedogenic structure, and is currently

exposed at the surface along Turkey Creek. Boundary characteristics between the two soils suggest a brief period of landscape stability followed by a period of aggradation with a return to landscape stability. Radiocarbon dates from the older part of Unit 2 at Recon John Shelter range in age from 2000 BP to 1000 BP (Zier 1989). The weak soil structure of the younger soil in Unit 2 suggests that a brief period of landscape stability elapsed after deposition of the unit ceased. Madole (1990) estimates that deposition of the younger part of Unit 2 correlates with an episode of deposition that occurred between about 800 and 100 BP in drainage basins from southern Utah and western Oklahoma. This period of deposition is believed by Madole (1990:108) to have ceased in Turkey Creek between 150 and 100 years ago. The poorly sorted, gravelly alluvium of Lithostratigraphic Unit 3 was therefore deposited over the last 100 to 150 years and represents recent alluvium.

An eleven-mile-long geomorphological and geoarcheological reconnaissance survey along Red Creek was conducted in 1997 by the Center for Ecological Archaeology, Texas A&M University (Kuehn 1998). The purpose of the study was fourfold: (1) to identify, describe, and map the major sedimentary environments, (2) to place the sedimentary environments in chronostratigraphic order, (3) to correlate the sedimentary environments of Red Creek with those studied in nearby locales (i.e., Madole [1989] for Turkey Creek and Butler et al. [1986] for the Red Creek Burial), and (4) to identify potential areas for buried archeological sites along the Red Creek drainage.

Red Creek is a braided stream west of Turkey Creek and near the western boundary of the FCMR. The deposits of Red Creek are divided into recent channel lag, terrace alluvium (T0, T1, and T2), alluvial fans, and colluvial aprons. The latter two differ in that the alluvial fans are generally larger, fan-shaped deposits of alluvially and colluvially derived sediments, while the colluvial aprons are formed specifically through slope wash.

The modern floodplain (T0) ranges from 0.5 to 1.0 m above the present channel. It has aggraded in the last 100 years, and no sites older than the historic period would be found in their original context in these deposits or in the recent channel lag. The T1 terrace is also of late Holocene age. It is best preserved in the broader portions of the valley at elevations from 1.5 to 2.0 m above the channel. This terrace has developed in the last 100 to 150 years. The highest depositional terrace identified is a T2 terrace, which is middle to late Holocene in age. This terrace fill is recognized by a series of buried soils displaying various stages of pedogenesis. A radiocarbon sample collected from an exposed hearth suggests that the fill could be older than 3000 BP (Kuehn 1998:22). However, it should be noted that there is some evidence to suggest that the radiocarbon sample was collected from sediments that may

be associated with slope wash or alluvial fan deposits; therefore, this date may be associated not with floodplain aggradation, but rather with a later episode of slope wash deposition.

The modern floodplain in the Red Creek drainage (Kuehn 1998:16) is correlated to Madole's (1989:284-285) Lithostratigraphic Unit 3 in the Turkey Creek drainage. Although Madole identified two distinct surfaces, an upper and a lower, only one surface is identified in Red Creek (Kuehn 1998:16). The T1 terrace in Red Creek may correspond temporally and vertically with the upper Unit 3 surface at Turkey Creek. It is suggested that it also corresponds regionally to episodes of stream aggradation reported from the Colorado Plateau, portions of the Basin and Range Province, and portions of the Southern High Plains and Northwestern Plains (Albanese and Wilson 1974; Kuehn 1993; Madole 1989). According to Kuehn (1998:17), the T2 terrace appears to correlate with the upper portion of Unit 2 at the Recon John Shelter in the Turkey Creek drainage (Madole 1989).

Both the T1 and T2 terraces appear stratigraphically and chronologically similar to two small remnant terraces identified along the East Fork of Red Creek by Butler et al. (1986). The lower terrace at the Red Creek Burial (Butler et al. 1986) rises 3.0 m above the modern creek bed, and a charcoal sample, collected from a hearth in the terrace fill, produced a radiocarbon age of 1,070 ± 70 BP A second, highly eroded terrace remnant rises 6.5 m above the modern channel bottom at this site (Butler et al. 1986). According to Butler et al. (1986:8), the two terraces most likely correspond to two periods of aggradation defined by Hunt (1954) for southeastern Colorado; the Piney Creek alluvium (higher terrace), and the Post-Piney Creek alluvium (lower terrace).

The alluvial fan sediments that mantle Red Creek alluvial sequences suggest that fan deposition may have been more common during the late Holocene (Kuehn 1998:18). However, colluvial/slope wash deposits often form thin mantles over bedrock, creating thick sediment accumulations with multiple buried soils that can extend down to the modern creek channel. These colluvial aprons and interbedded soils exhibit potentially complex horizontal/vertical relationships with the alluvial sequences (Kuehn 1998:18). Morphology of these sediments is complex, and it is likely that multiple episodes of slope wash deposition occurred during the Holocene.

The potential for archeological sites to be preserved along the Red Creek drainage varies with the age of the site and its geomorphic context. Sites dating from the Historic period, dating less than 200 years old, will be associated with the T0 floodplain or T1 terrace. Sites older than 3,000 years, however, are limited to the T2 terrace and to the remnants of the Pre-Piney Creek alluvium, and to the alluvial fan and

slope wash aprons. Due to the high-energy nature of the deposits within the T2 terrace, site preservation of these older sites may be better in the alluvial fans and slope wash aprons. It is possible, therefore, that Early and Middle Archaic sites are located in some deposits along Red Creek, but that sites dating to the Late Archaic and Ceramic periods possess a better potential than the earlier sites because of the variability in preservation potential that characterizes many of the sedimentary environments of Red Creek (Kuehn 1998:22).

Topography

Topography of the FCMR varies throughout, primarily reflecting a landscape typical of the transition from the foothills to the plains. One of the more geomorphologically interesting features and one that is especially important to this project is Booth Mountain in the south-central portion of the FCMR.

Booth Mountain has steep northern slopes and more gentle slopes to the east and west from the crest of the anticline axis, and slopes gently to the south. Several steep-walled tributary drainages are present on Booth Mountain, and they pose an interpretive conundrum because the presently available moisture could not have produced drainages of these sizes in the not-too-distant past. Tributary sizes indicate that these drainage were once third- or fourth-order drainages (Strahler 1952); presently, they are first- and second-order drainages. Increased precipitation at the end of the Pleistocene could not account for the flow necessary to incise such steep drainages through the Purgatoire and Dakota Sandstone and into the underlying Jurassic Morrison Formation. The drainages are deeply incised into pre-Cenozoic formations, suggesting that they were formed by ancient fluvial processes.

In order to explain the origin of these drainages, present day topography, bedrock lithology, and aerial photographs were researched. It is suggested that Table Mountain and Booth Mountain are the physical expressions of the once continuous Red Creek/Turkey Creek anticline, which is now separated by Sullivan Canyon. Regional uplift of the Front Range and the adjoining Great Plains in the very late Tertiary resulted in fluvial degradation and canyon cutting. Large tributaries from the Front Range, supplied with glaciofluvial recharge from the melting Pleistocene glaciers, eroded the Cenozoic sediments from the anticline. As the cover of these rocks was eroded, the streams were lowered onto the folded and faulted Cretaceous and Jurassic Formations. Supplied with a heavy discharge and increased sediment load, the streams from the uplifted Front Range created a braided channel pattern. These braided streams flowed in a generally southward pattern and eroded the softer sediments from the anticline. The course of Sullivan Canyon was probably formed during the Pleistocene through weathering of the overlying Jurassic, Cretaceous, and Tertiary sediments

through fluvial processes. The softer rock has since weathered in places below the crest of the anticline to create the flat valley bottom of Sullivan Canyon that separates the two, once-continuous, folded and faulted anticlines. At a later date—probably during the early Quaternary—water from the various streams flowing across the anticline was captured through headward erosion and diverted into a single larger drainage that flowed through Sullivan Canyon. With the increased velocity, Sullivan Canyon continued to erode into the softer Jurassic sediments to create the broad valley of Sullivan Canyon seen today.

The steep north slopes of Booth Mountain and the west slopes of Table Mountain are eroded into the Morrison and Ralston Creek lithostratigraphic units. Three prominent notches are visible along the northern rim of Booth Mountain, while similar notches are visible along the western slopes of Table Mountain. These notches mark the courses of pre-Holocene stream channels. Small interior basins that support meadow flora often appear at the downstream sides of the notches. These basins are superimposed over Jurassic claystones and limestones. These impermeable strata trap rainwater and, to a lesser extent, snowmelt, and through interflow, direct the water into the larger drainages. The water retained in the basins permits meadow ecozones to survive in an otherwise pinyon and juniper woodland.

The relict courses of two streams are clearly visible at the northern end of Booth Mountain. These stream courses are manifested as steep-walled canyons, one that originally flowed southwest into Booth Gulch and a second that flowed southeast into Turkey Creek. Both of these stream courses are close to prominent notches at the top of Booth Mountain. The original channel course was from the north through the notch and to the east. Today, the drainage exits Booth Mountain through Booth Gulch and takes a bend to the north to enter Pierce Gulch, but the drainage may have at one time continued along a more southerly route to Booth Gulch. These seemingly out-of-place drainages on Booth and Table Mountains represent relict drainage patterns that were diverted from their courses into Sullivan Canyon through either stream capture or isolation due to the weathering of the erodible Jurassic Formation. Steep-walled drainages, small interior basins superimposed onto Jurassic strata, and prominent notches are the topographic expressions of ancient hydrological systems.

Climate

FCMR lies in a region characterized by a mid-latitude, semi-arid continental climate with sharp seasonal variations. Summers are long and warm; winters are short and occasionally very cold. July has mean annual highs of 88° F (31° C). January is the coldest month, with a mean low of 15° F (-9° C). Precipitation is erratic and mainly falls as heavy thunderstorms during the months of April through September (Zier et al.

1987:1-13). The average annual precipitation is 17.5 inches(44 cm).

Two models for ancient climatic patterns in North America are commonly used by archeologists. The first, proposed by Antevs (1955), envisages climatic change as slow and gradual. Consequently, he defined only three major climatic episodes for the Holocene (or Neothermal, in his nomenclature): (1) Anathermal (10,150-7,000 BP), (2) Altithermal (7000-4500 BP), and (3) Medithermal (4500 BP-present).

Antev's general model has been augmented by one based on the European Blytt–Sernander model, which identifies short periods of climatic stability, or dynamic metastable equilibrium, interrupted by rapid changes to new stable states (Wendland and Bryson 1974; Wendland 1978). The episodes are as follows: (1) Late Glacial 13,000-10,030 BP, (2) Pre-Boreal 10,030- 9300 BP, (3) Boreal 9300-8490 BP, (4) Atlantic 8490-5060 BP, (5) Sub-Boreal 5060-2760 BP, (6) Sub-Atlantic 2760-1680 BP, (7) Scandic 1680-1260 BP, (8) Neo-Atlantic 1260-850 BP, (9) Pacific 850-400 BP, (10) Neoboreal (Little Ice Age) 400-100 BP, and (11) Recent 100 BP-present. There is, however, much regional variation in the dating and severity of these episodes because of their transgressive nature (Wilson 1988). Therefore, more local studies are necessary for any intensive study of human–environment relationships.

Localized studies that are available have recently been synthesized by Zier and Kalasz (1999:21-24), and the following is taken from this synthesis. Prior to 11,500 BP the environment of southern Colorado was still glacial, with average temperatures as much as 27° F colder than today's. It was also probably much drier than today. However, toward the end of the Pleistocene these cold conditions began to ameliorate concomitant with the beginning of the Holocene. This warming trend was at least partially responsible for the massive Pleistocene extinctions, which continued throughout the Clovis period and beyond. As a modern climate was established toward the end of the Folsom period, seasonal fluctuations in climate became more pronounced.

The Altithermal episode was a period of increased temperature and aridity, possibly composed of two distinct drought periods. It had a profound affect on the available biota of southern Colorado, although whether it necessitated a complete abandonment of the Colorado Plains by human groups, as has been posited elsewhere is not yet clear (cf. Buchner 1979).

After the Altithermal, southern Colorado witnessed a change to more modern conditions—i.e., an increase in precipitation and a decrease in average annual temperatures—and there is no evidence for major climatic change until the first millennium AD, when eastern Colorado is thought to have experienced wetter and

colder conditions than those of today. There is some evidence for drier conditions between approximately AD 1000 and 1300. During the Neo-boreal ("Little Ice Age"), climatic conditions became cooler and wetter. The middle of the last century saw the establishment of today's climatic regime.

The Biotic Environment

A total of five ecosystems are found in the FCMR, following the classification system employed by Zier and Kalasz (1999:10-13). The grassland ecosystem comprises the extreme eastern portion of FCMR as well as intermontane basins throughout the rest of the reservation. The dominant grasses are blue grama, buffalo grass, western wheatgrass, sand dropseed, sand bluestem and needle-and-thread. Yucca, prickly pear cactus, and sagebrush are also present. Mammals include shrew, eastern mole, western small-footed myotids bat, cottontail and jackrabbit, ground squirrel, prairie dog, pocket gopher, pocket mouse, coyote, swift and red foxes, bobcat, weasel, badger, skunk, mule and white-tailed deer, elk, and pronghorn antelope.

The pinyon–juniper woodland ecosystem lies to the west of the grasslands at a slightly higher elevation. It includes pinyon, rocky mountain juniper, one-seed juniper, blue grama, June-grass, Indian rice-grass, fescues, muhly, bluegrass, yucca, and prickly pear. Mammals include cottontail and jack rabbit, squirrel, chipmunk, mouse, Mexican woodrat, bats, porcupine, coyote, gray fox, weasel, badger, skunk, mountain lion, bobcat, mule deer, elk, and pronghorn antelope.

At the same elevation as the pinyon-juniper ecosystem is the montane shrub lands ecosystem. Gambel's oak and serviceberry are found, together with skunkbrush, smooth sumac, wax currant, rabbitbrush, chokecherry, wild rose, needle-and-thread, blue and side-oats grama, western wheatgrass, and mountain muhly. Mammals include the shrew, bat, cottontail and jackrabbits, squirrel, chipmunk, prairie dog, northern pocket gopher, woodrat, mouse, vole, black bear, coyote, gray fox, ringtail, western spotted skunk, mountain lion, bobcat, bighorn sheep, mule deer, and elk.

The montane forest ecosystem is represented primarily by stands of ponderosa pine. Other plants include aspen, white fir, limber pine, Colorado blue spruce, lodgepole pine, wax currant, mountain maple, Arizona fescue, sulphur-flower, and kinnikinnik. Mammals include bats, shrew, cottontail and jack rabbit, squirrel, chipmunk, woodrat, mouse, porcupine, coyote, red and gray foxes, black bear, weasel, skunk, mountain lion, bobcat, bighorn sheep, elk, and mule deer.

The riparian ecosystem is found along major water courses. The Plains cottonwood is commonly found along with willow, alders, and sedges. Other plants

include narrrowleaf cottonwood, broad-leaved cat-tail, great bulrush, salt-grass, sand dropseed, river birch and rushes. The availability of water and food in this system attracts a wide array of mammals.

Although no longer present in the area, perhaps the most important prehistoric and historic economic resource was the bison (*Bison bison bison*). It provided aboriginal groups with food, and materials for clothing, utensils, glue, bindings, and tipi covers (Roe 1951; McHugh 1958). It is difficult to gauge the natural migratory movements of this animal—and the impact bison had on aboriginal settlement patterns—because their movements had been disrupted by EuroAmerican immigration by the time the first commentators on bison movements had appeared in the region. Nineteenth-century travelers referred to bison being in the mountains in and around the headwaters of the Arkansas River (Roe 1951:548-549). Interestingly, these references indicate that these areas were *wintering* grounds, a reversal to what would be expected based on migratory studies elsewhere that showed bison moving into the lower foothills for the winter months. However, as previously noted, it is possible that by the time these observations were made (1844 and 1858), their natural migratory patterns had already been seriously disturbed. Alternatively, the bison wintering in the headwaters of the Arkansas and throughout the Salida area may have summered at much higher elevations to the west.

The Cultural Environment

The following discussion is intended to allow the reader to place this volume into a wider regional perspective. It relies upon, but is not intended to replace, the excellent syntheses provided by Anderson (1990), Athearn (1985), Cassells (1997), Eighmy (1984), Guthrie et al. (1984), Mehls and Carter (1984), Zier et al. (1987) and Zier and Kalasz (1999), to which the reader is referred for more detailed and specific information. The location of FCMR in the foothills of the Rocky Mountains means that prehistoric populations undoubtedly had cultural ties to, and were influenced by, contemporary cultures in the adjacent plains and mountains. There is even evidence that at certain times during prehistory southeastern Colorado was influenced by cultures of the American Southwest.

The Regional Context

To place FLC's work at FCMR in context, the following section briefly reviews the archeology of both the plains and the mountains (in particular the Front Range). It draws primarily on historical overviews provided by Frison (1973), Wedel (1983), Duke and Wilson (1995a), and Krause (1998) for the Plains, and Cassells (1992) for the mountains.

Plains archeology was a relatively late entry into American anthropology, probably for two reasons. First, it lacked the monumental architecture and the sophisticated and well-preserved material culture that had attracted early students to places like the Southwest. Second, influential early anthropologists, from Clark Wissler to Alfred Kroeber, had declared the region uninhabitable before the acquisition of the horse (Frison 1973:151).

Throughout the 1920s, however, antiquarians began working in the Plains. There were still no systematic investigations or excavations, and some strange theories prevailed: for example, the supposed Welsh influence on the Mandan of the Middle Missouri region (Frison 1973). The "backwater" status of Plains archeology changed in the 1930s as a result of the number of early human discoveries found in the region, which put Plains archeology in the forefront of this study. Sites like Lindenmeier and Dent in Colorado, together with Clovis and Folsom in New Mexico, were discovered in this decade. During this same decade, theoretical contributions from William Duncan Strong, Waldo Wedel, and Alex Krieger helped Plains archeology gain a national stature (Duke and Wilson 1995b:3), and for a while the Plains became a "high-status" area of study.

The second boost to Plains archeology resulted from the threatened loss of thousands of archeological sites in the Missouri River floodplain through reservoir construction for recreation, storage, and hydroelectric facilities (Krause 1998:58). Surveys to locate and record these sites began in 1946 under the direction of the Smithsonian Institution, with field headquarters at the University of Nebraska. The final survey was completed in 1968. Massive data banks were produced, and a regional culture history was constructed (Frison 1973). Government involvement in Plains archeology became even greater in the 1960s with the onset of the modern era of cultural resource management. However, because large portions of the Plains are privately owned, and therefore not under the jurisdiction of federal conservation laws, the importance of archeological studies of large federally owned areas such as the FCMR becomes especially meaningful.

Despite the early important theoretical contributions of Plains archeologists like William Duncan Strong (1935) and Waldo Wedel (1936), Plains archeology has never flirted with archeological theory for its own sake. Rather, it has been dominated by the practical necessities of dating sites and erecting spatio-temporal frameworks (Duke and Wilson 1995), although some elements of processualism have become important mainstays of contemporary Plains archeology (e.g., Calabrese [1972], Johnson [1988], Bamforth [1988], or Kelly and Todd [1988]). Even postprocessual studies have made their way onto the Plains (Duke and Wilson 1995a). The advocacy of particular theoretical paradigms seems, however, to have been driven primarily by the need to

understand the prehistory of the Plains, as opposed to Plains data being used merely as a testing ground for proposed theoretical contributions to the discipline at large.

The cultural taxonomies and classifications used for the southern Colorado Plains are implicit amalgamations of taxonomic systems proposed by McKern (1939), and Willey and Phillips (1958). Thus, we note the interchange of McKern's "focus" and Willey and Phillips's "phase" throughout much Plains archeological writing (see also Chomko et al. 1990:9). The terms stage and period have also become virtually synonymous.

It is fair to say that the processes behind the patterns that constitute the culture-historical sequences of southeastern Colorado are still essentially unknown. For example, although lengthy discussions on the (dis)similarities between projectile points and other diagnostic materials have been made by numerous workers (e.g., Gunnerson 1987), there has been less discussion about whether these patterns are the result of migration, diffusion, or other cultural factors. Projectile-point styles seem to represent distinct horizon styles that crosscut other cultural boundaries, and it is apparent that an adequate understanding of the area's prehistory cannot be completed until these variables have been evaluated.

In previous reports of our work at FCMR, we have used Eighmy (1984) as the primary organizational framework. Eighmy divided the chronology of southern Colorado into four periods: Paleo Indian; Archaic; Ceramic; and Protohistoric/Historic. However, we are persuaded by Zier and Kalasz's (1999:69) recent reworking of Eighmy's basic schema based on new data and a clarification of the criteria used to distinguish between different taxa. Their reworking retains the Paleoindian and Archaic terms as stages, and replaces the Ceramic period with the Late Prehistoric stage. The Protohistoric period is dated to AD 1450-1725. In the following synthesis we use the dates for these stages and periods suggested by Zier and Kalasz (1999:69).

Paleo Indian Stage The Paleo Indian stage, which dates from approximately 11,500 BP to 7800 BP, is a well-documented phenomenon in the Colorado Plains, the area producing many significant finds. The Paleo Indian stage straddles the transition from terminal Pleistocene to early Holocene environments with an accompanying change in fauna and flora. It is typified by nomadic hunters and gatherers concentrating on the killing of large fauna, such as mammoth and now-extinct forms of bison. The Paleo Indian stage is divided into the Clovis (11,500-10,950 BP), the Folsom (10,950-10,250 BP), and the Plano (10,250-7800 BP) periods. Although both Clovis and Folsom periods are identified by distinctive fluted points, the processes of transition between the two are unclear, and Frison et al. (1991) have proposed a transitional Goshen complex. The Plano period is characterized by a proliferation of point types, which may reflect

increased territoriality and technological specialization as greater resource stability preempted the need for long-distance interaction networks (Hayden 1982:119).

The presence of humans in southern Colorado and surrounding areas during the Paleo Indian stage is represented primarily by surface finds (for example, there are two Folsom finds on the Chaquaqua Plateau [Campbell 1976]). This area is close to the Folsom type-site, located just southeast of Raton, New Mexico. Within 200 miles of FCMR are the well-known Paleo Indian sites of Cattleguard, Lindenmeier, and Jurgens. The bison-kill site of Olsen-Chubbuck (Wheat 1972) is also relatively close, and it is likely that more Paleo Indian sites will be found in the future.

Archaic Stage The Archaic stage begins about 7000 BP in southern Colorado, and, as a whole, sites attributed to this stage are well represented. It is divided into three periods. It is characterized by a shift to a wide subsistence spectrum of hunting and gathering, an increase in the use of groundstone tools in plant preparation, and, at its end at least, greater sedentism, which perhaps is a precursor to a dependence on cultivated plants.

Early Archaic period (7800-5000 BP) sites are relatively rare in southern Colorado and the Upper Arkansas River Basin (Eighmy 1984:68; Zier and Kalasz 1999:100). Indeed it is possible that during this period, which coincides with the Altithermal warming episode, the Plains were abandoned or minimally occupied by humans (Reeves 1973; Benedict and Olson 1978; Buchner 1979). The Middle Archaic period (5000-3000 BP) is well represented by both radiocarbon and typologically dated components in southern Colorado (Eighmy 1984). Point types bear a resemblance to Southern Plains and Southwest types (including the Picosa Culture). Archeological evidence for the Late Archaic period (3000-1850 BP) in southern Colorado is provided by a series of sites—including stratified rock shelters—such as Carrizo, McEndree Ranch, Medina, Recon John (which is located on the FCMR and described in more detail below), and Trinchera. The last site provided not only stratigraphic sequences, but also organic material and bones that indicate an emphasis on small-game hunting (Wood-Simpson 1976:177). Archaic sites in southern Colorado are sufficiently numerous to allow the reconstruction of settlement systems: see, for example, Alexander et al.'s (1982) study of the archeology of the FCMR, Lutz and Hunt's (1979) study of the Purgatoire and Apishapa highlands, and Eddy et al.'s (1982; 1984) study of the John Martin Reservoir.

Late Prehistoric Stage The Late Prehistoric stage (Zier and Kalasz 1999) is used to represent the last two thousand years of aboriginal occupation of the study area. The major technological innovations are: ceramics, the bow and arrow, an increase in stone-built architecture, and the appearance of small quantities of cultivated plants, in

particular maize. This stage corresponds to Eighmy's (1984) Ceramic period. Eighmy divided the Ceramic period into Early and Middle subperiods. Gunnerson (1987:97) and Zier et al. (1987:2-13) added a Late subperiod, which corresponds to Eighmy's Protohistoric period. Within this stage, Zier and Kalasz (1999:69) define three periods. The Developmental period dates from AD 100-1050, and corresponds essentially to Eighmy's Early Ceramic period (Zier and Kalasz 1999:160). The Diversification period (AD 1050-1450) is broken into the Apishapa and Sopris phases, which corresponds to Eighmy's Middle Ceramic period (Zier and Kalasz 1999:189). The Protohistoric period is dated to AD 1450-1725 and correlates with the abandonment of Apishapa phase sites and the incursion of Athabascan groups (Zier and Kalasz 1999:250).

The Developmental period dates between AD 100-1050. After about AD 450, there appear to be differences between sites found along the Arkansas and Platte River systems, respectively. Sites along the Arkansas River system are assigned to the Graneros focus (Withers 1954), which is characterized by cord-marked pottery, corner-notched projectile points that are later replaced by side-notched forms, and slab-constructed circular dwellings. The Parker focus, which might be merely a geographical variant of the Graneros focus (Butler 1986:213), or vice-versa, is heaviest in the Denver Basin and South Platte River Valley region, and may extend to the San Luis Valley. According to Baugh (1994:269), the most recent (Developmental period) component at the Recon John shelter, located on the FCMR, may represent the most southerly and westerly extension of the traditional Plains Woodland complex, as exemplified by the Valley and Keith foci of the Central Plains.

The Diversification period (AD 1050-1450) of eastern Colorado contains variants of the Plains Village tradition, such as the Upper Republican complex, the Upper Purgatoire complex, the Apishapa phase, and the Upper Canark Regional variant. The Upper Republican complex (AD 1000-1450) is characterized as a sedentary culture based on hunting, gathering, and horticulture (Gunnerson 1987:68-71). It is located primarily in southern Nebraska and northern Kansas. The complex is associated with the prehistoric Pawnee by Strong (1935). The Upper Purgatoire complex (Dick 1963) is dated approximately AD 1000-1225 (Cassells 1997:223-224; Wood and Bair 1980:15), and is divided into three phases: Initial Sopris, Early Sopris, and Late Sopris (Cassells 1997:223-224). Subsistence during this time was a mixture of foraging and farming, and its architectural and ceramic styles reflect both Plains and Southwestern influences. It has recently been suggested that Sopris phase sites represent an archeological frontier of the northern Southwest (Mitchell 1996). Alternatively, Turner (1980) has suggested that Sopris phase populations may be Athabascan, based on a fairly high frequency (23%) of triple-rooted molars in a Sopris phase skeletal assemblage from the Trinidad Lake area.

The Apishapa phase (or focus) was first recognized by Renaud (1931a) and formally defined by Withers (1954). It may have antecedents in the Graneros focus (Baugh 1994:269). It is characterized by villages—of varying size—composed of upright slab-stone houses, often in defensible locations. The proximity of these sites to arable land (Campbell 1969:418-419) suggests some level of commitment to horticulture. Ireland (1968) proposed that at the Snake Blakeslee site (Gunnerson 1989) occupants subsisted primarily on corn and bison. Campbell (1969), using supposed similarities between Apishapa sites and contemporary materials in the Texas and Oklahoma Panhandles, placed the phase into the Panhandle aspect. Lintz (1978, 1984, 1986) in a reworking of this material, proposed the Upper Canark variant (AD 1200-1500), which contains the Apishapa phase and the Antelope Creek phase of northeastern New Mexico and the Texas and Oklahoma Panhandles. Baugh (1994:282) has further added to the Upper Canark variant the Zimms complex of western Oklahoma and the eastern Texas Panhandle, and the Burial City complex of the northeastern part of the Texas Panhandle (see also Drass 1998:418, 422-425).

The Protohistoric period (AD 1450-1725) is characterized by ethnographically recognized tribes who were either hunters and gatherers, or part-time horticulturalists. Aboriginal inhabitants during this period had access to European goods, but were not in regular face-to-face contact with Europeans. A major Colorado Plains group was the Athabascans (specifically the Apache), who migrated south as part of the large Athabascan movement that began in Alaska sometime in the first millennium (Duke and Wilson 1994; Vickers 1994). They grew corn, beans, and squash, hunted extensively, and traded with Puebloan groups in northern New Mexico. These groups are represented archeologically by the Dismal River aspect (AD 1675-1725), which is found throughout large portions of the western plains including eastern Colorado (Gunnerson 1987:102-107).

Archeological evidence suggests that the Apache entered southern Colorado sometime after AD 1300 (Campbell 1969:496). Excavations at a series of stone-circle sites associated with the Eastern Apache, located on the Carrizo Ranches on the Chaquaqua Plateau, were radiocarbon dated to the 14th century (Kingsbury and Gabel 1983). These sites also contained Pueblo IV pottery indicative of interaction with groups to the south. Other tribes of note during this period were the Comanche and the Arapaho and Cheyenne. A more detailed review of the ethnohistoric evidence is found in the section on FCMR ethnohistory.

Front Range and Rocky Mountains Prehistory

The Front Range, as a unit of study, consists of that portion of the eastern flanks

of the Rocky Mountains from southern Alberta in Canada to southern Colorado. Although the eastern slopes of the Rockies provide a dramatic and abrupt boundary to the western plains, in many areas, most notably Wyoming and, to a lesser extent, Montana, the mountain wall is broken by large basins that serve as western extensions of the plains grasslands. Indeed, Chomko (1991), in referring to Wyoming, has shown how that state's prehistory has been confused by mistakes over what constitutes *plains*, and by extension, therefore, the application a priori of Plains cultural taxonomies to the state's archeology.

Archeological investigations of the Rocky Mountains are recent, beginning in earnest only in the 1970s with the advent of federal conservation laws in both the United States (Mattock and Duke 1992:176) and Canada (Ronaghan 1986:passim). Prior to this period, anthropologists, beginning with Alfred Kroeber (1939), believed that the mountains were uninhabitable before acquisition of the horse. Archeologists, turned away by limited access to high mountain areas (Cassells 1992:12-13), were not inclined to test Kroeber's proposition.

Despite the massive increase in the database as a result of government-mandated investigations, much of the archeological record of the Front Range and Rockies is still "spotty," as a result not only of the nature of the archeological record itself (cf. Weimer 1995:96), but also of the rather "shot-gun" approach to investigations. Long-term research projects—such as Benedict's (1992; Benedict and Olson 1978) in the Indian Peaks Wilderness Area of Rocky Mountain National Park—appear as exceptions to the rule. Thus, long-term archeological investigations at locations such as FCMR are important for their contribution to our archeological knowledge, not only of the immediate area but also of the Front Range in general.

Despite the different goals of the various individual research and management problems that have been conducted or are in progress along the Front Range and in the Rockies, and despite the different backgrounds of the investigators involved in them, it is possible to isolate a number of issues that seem consistently to be raised. The first issue concerns the nature of the archeological record itself. This record is a product of essentially nomadic inhabitants existing in environments not conducive to good archeological preservation (Benedict 1992:1; Weimer 1995:96). Consequently, archeological interpretation has tended of necessity to oversimplify complex patterns of human behavior. It can be said that in these areas archeology, as with most hunting-and-gathering situations, can define only *average* behavior patterns, "hat is, how groups in general solved certain problems over long time periods" (Driver 1978:125). All archeologists working on the Front Range are hampered by an inadequate temporal resolution for their sites, which causes great variation between *precise* and *archeological* contemporaneity, to use Higgs and Jarman's (1975:5) terms. This irresolution, caused

by the nature of the archeological record, is at the root of all the other issues discussed below.

The second issue concerns the degree to which the culture chronologies of the Front Range and Rocky Mountains can be based on those of the adjacent areas, especially the Plains (cf. Black 1991). This ambivalence has lead to the application of oxymorons, such as foothills-adapted, Plains Woodland cultures (recognized as such by Black [1994]) in the Hogbacks west of Denver). More insidiously, the importation of external systematics has hampered a fuller understanding of the actual cultural dynamics of the area. Recognizing heterogeneity in the archeological record might help in constructing local chronologies, but is of less value in the reconstruction of actual prehistoric *behavior*. For instance, witness the relatively small differences in assemblages between the Hogback, Graneros, and Parker phases (Cassells 1997:210). Our inability to correlate artifactual heterogeneity with actual behavioral patterns, whether they are at the level of seasonal facies of a single economy or at the level of distinct ethnic groupings, will continue to confound the creation of more sophisticated and realistic prehistoric behavioral models.

The third issue, obviously related to the first two, concerns the specific ways in which the Front Range and Rocky Mountains were exploited prehistorically. The first strategy implicates these two areas as marginal, exploited by prehistoric peoples whose primary territories lay either on the Plains, on the Great Basin, or in the Southwest. As noted earlier, ethnographers like Kroeber were disposed to this strategy. The second strategy sees these areas simply as part of a total seasonal round that encompassed other adjacent areas. Examples of this strategy have been proposed by Bender and Wright (1988), Quigg (1974), Duke (1978), and Benedict (1992). The third strategy sees the Front Range and the Rocky Mountains as supporting year-round nomadic populations. This strategy has been proposed most forcefully by Brian Reeves (1981) in Southern Canada, who has gone so far to say that at least in certain time periods, the Front Range was a separate cultural area, supporting year-round residents who considered themselves ethnically separate from resident groups both to the east and west. The third strategy is also represented by Black's (1991) Mountain tradition. This tradition existed from about 9500 BP to at least 4500 BP, with a continuation in certain areas until 700 BP when it was replaced by assemblages assignable to the prehistoric Numic (Ute and Eastern Shoshone). Spatially, the Mountain tradition is found in upland areas as far north as southern Montana and as far south as northern New Mexico. Included in this tradition are the following complexes: Rio Grande, Uncompahgre, Rocker, Mount Albion, Magic Mountain, and Apex. Important sites along the Front Range, such as LoDaiska, Wilbur Thomas, and Willowbrook, probably served as winter residential bases, as did sites along the foothills west of the Continental Divide, such as Deluge Shelter, Sisyphus Shelter, Taylor, and Moore (Black 1991:13). This tradition argues

for a year-round exploitation of the mountains by nomadic to semi-sedentary groups, for a long-term continuity in patterns of exploitation, and for an archeological identity for the mountains that is distinct from adjacent lowland areas, beginning as early as the late Paleo Indian period (Black 1991:1).

It is doubtful whether the *present* archeological record (anywhere along the Front Range) allows us to adequately test such hypothetical strategies. Nevertheless, merely their reasonableness as *hypotheses* throws into doubt any complacency archeologists might have about the hopes of soon achieving any degree of understanding of prehistoric exploitation patterns in the area (Duke 1978).

Fort Carson Prehistory

Generally, sites become more common at FCMR as they get more recent, reflecting not only possibly larger human populations, but more likely the better preservation potential of more recent archeological resources (Kuehn 1998; Zier et al. 1987:2-44). The numerous surveys conducted on the reservation in the last ten years suggest that the majority of datable prehistoric components fall between approximately 1500 BC and AD 1500, while most datable historic structures date to the last few decades of the 19th and the first half of the 20th centuries (e.g., Van Ness et al. 1990; Jepson et al. 1992).

Prior to the FLC inventory in 1996, there was only one piece of evidence on the FCMR that belongs to the Paleo Indian stage, an isolated projectile point dated to approximately 8000 BP, and it is from a single multicomponent open-lithic scatter (Zier et al. 1987:2-43). Since that time, additional Paleo Indian projectile point fragments have been found at multicomponent sites in the south and central portions of the base. These point types and associated sites are discussed in reports by FLC (Charles et al. 1997, Charles et al. 1999b).

Although definite Archaic sites are rare on the reservation, most flaked-lithic sites are undated, and so many of these could be Archaic in age. An important multicomponent site on the reservation is the Recon John shelter (Zier and Kalasz 1991). This rock shelter contained three radiocarbon-dated components: Middle Archaic (4400-3700 BP), Late Archaic (2000-1800 BP), and Early Ceramic (1800-1000 BP). Evidence for a hunting-and-gathering economy, with some degree of maize horticulture, was recovered from this site.

Early Ceramic, or Developmental period, sites are common at FCMR (Zier et al. 1987:2-9), although Zier cautions that some of these may be misidentified Middle Ceramic or Diversification period sites, because both periods have cord-marked pottery.

There are many Diversification period sites in the reservation, especially in its southern part. Apishapa phase lifeways have been elucidated through long-term investigations at the Avery Ranch site, the most recent of which were conducted by Centennial Archaeology in 1985 and 1986 (Zier et al. 1988, 1990). The Avery Ranch site, a multi-functional camp occupied in a single episode during the fall, dates to the thirteenth century. Zier identified four major activity areas, three of which contained architectural remains. Large quantities of butchered bison bone and charred seeds, especially *Chenopodium* (goosefoot), indicate a hunting-and-gathering economy, although a small amount of maize was also recovered. In general, Apishapa lifeways seem to have been organized around the efficient gathering and storing of wild plants, the hunting of deer, antelope and some bison, and the farming— albeit limited—of at least five different varieties of maize (Baugh 1994:278).

In keeping with the generally processual nature of archeological research conducted during the 1970s and 1980s, the FCMR prehistoric database has been subjected to a variety of settlement modeling. Zier et al. (1987:2-47-51) reject inductive-based models in favor of deductively generated predictive models that allow for a better control of sample universes. Despite the persuasiveness with which Zier makes his case, inductive models at least avoid the problem of a priori assuming which environmental variables were important in the selection of specific site locations (cf. Butzer 1982; Weimer 1995).

Predictive models for the Turkey Creek, Booth Mountain, and Red Creek areas were generated by Zier et al. (1987:2-86). Booth Mountain provided the most surprising results in terms of the frequency and distribution of archeological sites in an area assumed to be too rugged to have supported a large prehistoric population. It was determined that the highest site probability lay on the southern and western slopes of the mountain, with sites located along the drainages that flow into Booth Gulch rather than into Turkey Creek. It is possible that the very inaccessibility of Booth Mountain made it an attractive habitation. Very few sites were found on the east half of the mountain except for the rock art that is pervasive in Turkey Creek Canyon.

The subsistence and settlement model for FCMR, on which the predictive modeling is based, supposes that during the prehistoric period the area was part of a human migratory pattern that ranged from the high mountains to the open plains. A variety of animals and plants, of which pinyon nuts are considered of fundamental importance were used (Zier et al. 1987:2-59). Similar to studies elsewhere (e.g., Quigg 1974; Duke 1978), Zier et al. (1987:2-52) have proposed that large, winter base camps were established in the more sheltered foothills, along the Arkansas River and its permanent tributaries. Smaller camps, established in the spring and used throughout the rest of the year, were located along different routes radiating from the winter base

camps, in response to the seasonal availability of particular resources. In this regard, it is important to acknowledge that such annual subsistence rounds may have been far-ranging. Rockafellow's (1881) history of Fremont County, for instance, described historic Utes as summering in the higher elevations of the Rockies before coming down to winter base camps in the Arkansas River Valley, near Canon City. Thus, prehistoric sites found in the Monarch Pass area (Hutchinson 1990) may have relevance to fully understanding subsistence patterns in the FCMR area, especially given that the Arkansas River Valley was a primary communication corridor to the Monarch Pass area during the historic period.

Fort Carson Ethnohistory and History

From the initial period of European contact, which began in the middle of the 16th century, Plains Indians underwent profound cultural, social, and economic changes, descriptions of which need not be replicated here. Initial contact was at first indirect, in the form of long-distance trade (beaver and muskrat pelts in exchange for numerous European goods), but this was replaced by face-to-face contact and exchange. Beaver trapping (and later bison-hide tanning) brought the Plains into the world economic system (cf. Lewis [1942] for an early surgical analysis of its economic and social effects). Acquisition of the horse and gun helped individual Native American groups to resist European expansion, but often this was done by taking over the territories of Native American groups who were not so well equipped. The horse also caused major economic and social changes to Native American tribes, and these are well documented by Roe (1955). In general, the early period of European contact, then, can be seen as one in which Native Americans were forced to become much more mobile and to cope as best they could with the European economic nexus into which they had been so unwillingly drawn.

It is difficult to determine precisely which Native American tribes used the FCMR area because of its location on two major physiological zones (Plains and Mountains), its proximity to three culture areas (Plains, Mountains, and Southwest), and its proximity to important passes and trails used by many different groups. However, based on general knowledge of the ethnohistoric period in southern Colorado, and also specific references to places like Manitou Springs, some degree of confidence can be placed in stating that the area was utilized by at least four tribes: the Apache; Comanche; Arapaho; and Ute (Zier et al. 1987:2-166-171).

Southern Plains tribes first contacted Spanish groups beginning in 1541, when Coronado led an expedition across parts of New Mexico and Kansas (Hammond and Rey 1940). The groups he met were still essentially "prehistoric." Coronado encountered two groups called "Querechos" and "Teyas," although there is dispute as

to whether both were Apache, or Apache and Caddoan groups, respectively (cf. Weber 1990:XVIII-5-6). During the 16th century, more Spanish expeditions were sent throughout what was to become northern New Mexico and adjacent regions to extend Spanish sovereignty and to convert the Indians to Christianity. Of particular interest is the 1593 expedition of Francisco de Bonilla and Antonio de Humana. Although their exact route is not clear, it is possible that they traveled through the FCMR (Zier et al. 1987:2-94).

Beginning in the late 17th century, the Apache, mounted and heavily armed, became a dominant force on the Southern Plains, raiding for both horses and slaves that were then traded to the Spanish (Weber 1990:XVII-7). Despite the unstable relations between Apache and Pueblo groups it was, nevertheless, the former to whom the latter fled after a series of revolts (the biggest revolt started in 1680 and lasted for 12 years). In the early part of the 17th century, the Taos and Jemez Pueblos revolted against Spanish rule and established a new settlement called El Cartelejo in western Kansas, which was under the control of the Apaches. It is unclear whether El Cartelejo was a specific pueblo or a region (cf. Forbes 1960; Schroeder 1974). By the 1660s the Spanish had moved the fleeing Puebloans back to their original settlements (Forbes 1960:137-139), although the area continued to act as a refugium for Puebloan and Apache groups trying to escape Spanish domination. Throughout the 18th century, the Apaches lost both power and territory as the Comanche expanded, as eastern groups like the Kansa, Oto, Iowa, Ponca, and Omaha moved west, and as the area became a geopolitical arena contested by both France and Spain (Schlesier 1972).

The Comanche, together with the Ute, began to move into the plains of southeastern Colorado and adjacent Kansas at the beginning of the 18th century (Weber 1990:XVII-13). Notwithstanding their defeat by de Anza in 1779 near modern-day Pueblo (Athearn 1985:18), the Comanche continued to expand their hegemony throughout the southern Colorado plains and areas to the south and east during the 18th century. The Utes raided with the Comanche until the middle of the 18th century, when the Comanche turned on them. The Utes were originally mountain dwellers who made incursions into the Plains through many mountain passes (Hyde 1976:54-57; various papers in Nickens 1988).

Ulibarri, who in 1706 brought back dissident Pueblo Indians from refuges across the Arkansas River, reported that the Utes and Comanches were raiding the Apache between present-day Pueblo and Trinidad, although they had not yet succeeded in driving them out completely (Hyde 1976:64). A later Spanish expedition in 1719 led by Governor Valverde found Apache still occupying southeastern Colorado (Schroeder 1974). Valverde's professed objective was to prevent Ute and Comanche raids on the Apache, although the leisurely nature of the expedition suggests that he had no urgency

in accomplishing this (Hyde 1976:67-70). At least a secondary objective of the expedition was to show the Spanish flag in response to increasing French incursions into Spanish territory (Athearn 1985:14-16). These Spanish incursions increased until the outbreak of the French-Indian War of 1754 (Athearn 1985:17). During the latter part of the 18th century, increasing Arapaho and Cheyenne incursions into the western Plains began to shunt the Comanche southward (Hyde 1976). In 1786, the Spanish made a peace treaty with both the Comanche and the Ute (Athearn 1985:18).

During the 18^{th} and early part of the 19^{th} centuries, southern Colorado was infiltrated by *comancheros* (Hispanic and Pueblo Indian traders) and *ciboleros* (buffalo hunters) (Weber 1990:XVII-15; Baugh 1994). The *comanchero* trade was based on well-established prehistoric trade patterns between Pueblo farmers and Plains bison hunters (cf. Spielmann 1991). Initially involving native corn and bison products, by the beginning of the 18^{th} century the trade system incorporated Spanish goods, including horses and guns, as well as slaves. Trade fairs, such as the one at Taos, became an important component of the New Mexico economy (Carrillo 1990:XVIII-8). This changed, however, under American rule, since the *comancheros* were now considered thieves and villains (Carrillo 1990:XVIII-9). *Cibolero* hunting comprised huge bison-hunting expeditions from New Mexico into the adjacent plains to take back bison products to their home settlements. These expeditions climaxed in the early 19^{th} century.

Up to 1821, the ethnohistoric period of southern Colorado, as for adjacent areas, was characterized by processes that led both to the demise of aboriginal groups as independent entities and to increasing control over these areas by the Spanish who resided in areas to the south. However, southern Colorado was never successfully colonized by the Spanish (Carrillo 1990:XVIII-7), and the area was important to them primarily for the resources that it offered. After 1821, what Carrillo (1990:XVIII-1) calls the second period of historical culture change in the area was initiated. Mexican independence intensified trading opportunities between southern Colorado and Hispanic settlements to the south. This second period lasted until the Mexican War of 1846-48, which effectively ended Mexican domination of the area.

The earliest American interest in the FCMR resulted from attempts to explore beyond their recognized territorial boundaries because of the Louisiana Purchase of 1803, which put newly acquired American territory immediately adjacent to long-held Spanish lands (Athearn 1985:25). In 1806, Zebulon Pike led an official U.S. expedition up the Arkansas River into what would become Colorado. Pike traveled up the Arkansas as far as South Park and then returned to journey to Santa Fe as a "prisoner" of Spanish troops. Pike's foray was followed by a wave of fur trappers and then by more scientific and military expeditions (Zier et al. 1987:2-100), such as the

Long (1820), Dodge (1835), and Fremont (1843-44) expeditions, all of which went through or very near to the FCMR. Most important, Bent's Fort was founded in 1829, at the mouth of either the Huerfano River or Fountain Creek (Zier et al. 1987:2-104). This fort dominated regional trading for the next twenty years. There was little that the waning Spanish power could do to oppose increased American incursions into their lands (Athearn 1985:27). Finally, in 1822, the Republic of Mexico declared its independence from Spain, and the New Mexican governor, Facundo Melgares, immediately opened the province to traders of all nationalities (Athearn 1985:27).

The "American Period" officially began in 1848 with the annexation of Mexican lands by the U.S. under the terms of the Treaty of Guadalupe-Hidalgo (Athearn 1985:31; Carrillo 1990:XVIII-14). Manifest Destiny and the spirit of western entrepreneurship swept the study area. In 1851, the U.S. government decided to allocate specific tribal territories to the individual groups (Weber 1990:XVII-19-20), and in 1867 the government signed a treaty with many southern Plains tribes. This led ultimately to the Reservation Period and the removal of tribes from their homelands. The Comanche, for example, were placed on a reservation in western Oklahoma (Wallace and Hoebel 1952). The land now identified as FCMR became part of the newly defined Territory of Colorado, enacted by Congress in 1861 (Athearn 1985:64).

Gold mining played an important role in the European development of the FCMR area, particularly after the 1848 finds in California, which encouraged miners to search in various places throughout Colorado. Both Canon City and Pueblo served as supply centers for miners prospecting the Leadville lodes, but after 1863 the gold deposits there began to play out, and the two towns lost much of their importance (Zier et al. 1987:2-111). A silver rush in 1878 in the Wet Mountain Valley just outside Canon City temporarily revived hopes of renewed mining wealth (Athearn 1985:120). A second gold strike in the Cripple Creek area in 1890 temporarily revitalized the industry, which led to renewed prospecting in the FCMR, as well.

After the Civil War, population increased as the mining and agricultural potential of Colorado was realized, and as a result, various railroads were constructed throughout southern Colorado (Athearn 1985:89-110; Carrillo 1990:XVIII-21). Many local lines were built to transport coal mined from deposits east of Canon City, and the last 15 years of the 19th century saw Florence's brief rise as an oil-drilling center (Zier et al. 1987:2-113). During this same period, local stone-quarrying and cement-manufacturing plants were built in the general area, which included plants at Booth Gulch. Quarrying for building stone and clay was conducted at Stone City in Booth Gulch over a 10-to-15 year period. Clay mining was a viable operation at Booth Gulch and proved to be more long-lived than the quarrying of stone (Zier et al. 1987:2-115).

Cattle ranches, associated with the Santa Fe Trail, had been established in the area by the 1860s. The first herds were all longhorns brought in from Texas (Zier et al. 1987:2-119-120), although sheep were for a while the most important livestock (Zier et al. 1987:2-127). Settlement in the immediate FCMR took the form of isolated ranches, with most of the area being used as open range (Zier et al. 1987:2-125). A list of the late-19th-century ranches in the FCMR is provided in Zier et al. (1987:2-128-133). Colorado Springs was established in 1871, and in that same decade freight and passenger services were established between Colorado Springs, Canon City, and South Park (Athearn 1985:99).

The FCMR was established during the Second World War. Camp Carson was established in 1942, and Ent (later Peterson) Air Force Base was built a year later. Camp Carson was renamed Fort Carson in 1954, and in that same year both the United States Air Force Academy (USAF) and what would become NORAD were established (Zier et al. 1987:2-137-141).

CHAPTER 3
REVIEW OF PREVIOUS ARCHEOLOGICAL WORK IN THE FORT CARSON MILITARY RESERVATION

At FCMR, archeological investigations have generally paralleled the evolution of 20th-century American archeology, from ill-trained, albeit enthusiastic, amateurs to the theoretically and methodologically sophisticated projects of today's researchers, both private and university-based. The *Fort Carson Historic Preservation Plan* (HPP), compiled and edited by Zier et al. (1987), the *Cultural Resource Management Plan* (CRMP), by Zier et al. (1997), and more recently *Colorado Prehistory: A Context for the Arkansas River Basin,* by Zier and Kalasz (1999) contain detailed discussions of archeological investigations on the reservation and in surrounding areas. The following is, therefore, intended only as a brief synopsis of past archeological investigations in order to place current work into perspective.

The earliest known archeological work in the area of FCMR was conducted in the 1930s and 1940s by E.B. Renaud of the University of Denver (DU); his work is reported in several individual publications (Zier et al. 1987). It was Renaud (1931b) who named the *Turkey Canyon District* and recognized its potential archeological importance. In this district, which is immediately east of Booth Mountain, Renaud identified several prehistoric campsites, some of them with structural remains (5PE60, 5PE63, 5PE649), as well as some rock art (5PE58) and rock shelters (5PE62). Renaud excavated at least one rock shelter site, 5PE62, Renaud's Shelter(Zier et al. 1996:41). All of the above-mentioned sites were reevaluated by FLC during the summer of 1997 (Charles et al. 1999b).

In the 1930s, an amateur historian, CW. Hurd (1960), incorrectly identified a site he thought was Bent's first fort in the Arkansas River Valley. Later excavations and documentary research suggest that this site (5PE64) is later than Bent's stockade, and it is also in the wrong place (Zier et al. 1996:41). The results from testing suggest it is an early homestead (Andrew's Homestead) dating as early as the 1860s (Zier et al. 1996:41). The site is currently fenced and protected and was reevaluated by FLC (Charles et al. 1999b).

The University of Denver returned to the reservation in the 1960s and surveyed pieces of land along Red Creek, Turkey Creek, and Beaver Creek that were to be annexed by the U.S. Army (Withers 1964). A field crew from DU later excavated portions of the Avery Ranch site (5PE56) in 1965 and 1969 (Ireland 1968; Watts 1971, 1975). In that same decade, Bass and Kutsche (1963) reported on an aboriginal burial found by amateurs adjacent to Turkey Creek.

More amateur work was conducted by members of the Colorado Archeological Society (CAS) in the first part of the 1970s, which resulted in the recording of two rock art sites (5PE58 and 5PE163). One of these, 5PE58, had originally been located by Renaud (1930, 1931a) and rerecorded by Centennial Archaeology in 1988 (Van Ness et al. 1990). Both site locations were revisited by FLC over the course of the 1997 field season. As a result of the revisit, it was determined that 5PE163 was located incorrectly on the U.S.G.S. quadrangle map, and is the same site as 5PE58.

The appearance of the modern era of cultural resource management resulted in more intensive archeological investigations of the reservation. A 480-acre piece of land that straddled Renaud's original survey area was placed on the National Register in 1976 (5PE14) based on the significant rock-art sites found within its boundaries. However, the district was not fully inventoried until 1988. Six sites within the district boundaries (5PE58, 5PE60, 5PE62, 5PE93, 5PE94, and 5PE926) were reevaluated in 1997 by FLC (Charles et al. 1999b). Of these, only 5PE58, 5PE62, and 5PE93 contain rock art.

Grand River Consultants (GRC) inventoried approximately one-third of the base between 1978 and 1982 and provided a comprehensive listing of all the different site types found in the FCMR (Alexander et al. 1982). A total of 38,291 acres was inventoried, resulting in the identification of 98 prehistoric and 51 historic sites. Of these, 35 sites were subsequently test excavated (Hartley et al. 1983). Almost half (41) of the total sites reevaluated by FLC in 1997 were recorded during this early inventory.

Other consultants who have contributed to the data base and to the knowledge of the reservation include Goodson and Associates (Burns and Killam 1983), Metcalf-Zier (Zier 1984), and Centennial Archaeology (CA). This last company conducted a cultural resource inventory of 1,900 acres and test excavated several sites in the Multi-Purpose Range Complex (Zier and Kalasz 1985). They also inventoried 2,595 acres in Turkey Canyon (Van Ness et al. 1990), and 8,639 acres of high site-probability areas in other parts of the FCMR (Jepson et al. 1992). In 1984 and 1985, portions of the Avery Ranch site were excavated by a field crew from CA (Zier et al. 1988), and in 1986 the Recon John Shelter was partially excavated (Zier 1989). In addition to these inventories and excavations, CA conducted test excavations at several other sites, and these are reported in Kalasz et al. (1993) and Van Ness et al. (1990). Both Recon John shelter and the Avery Ranch site were reevaluated by FLC. Recon John shelter was determined to have significant intact remains and was recommended as eligible for nomination to the NRHP, while the Avery Ranch site, due to the extensive data recovery and the military impacts, was not recommended as eligible for nomination to the NRHP (Charles et al. 1999b).

Archeologists from CA prepared a comprehensive *Historic Preservation Plan* for the future management of cultural resources on the reservation (Zier et al. 1987). Preliminary site-location models generated as part of the preservation plan were subsequently tested in the field by Grant and Zier (1987). Since the preparation and implementation of this plan, further work has been conducted under its rubric. CA was responsible for producing the FCMR Database system to simplify access for managers and researchers to archeological data on the reservation (Mueller 1995) and for implementing a curation notebook and artifact database (Mueller and McBride 1995).

Besides these large-scale surveys and excavations, smaller surveys have also been conducted: for example, those related to the construction of soil conservation structures, a fiber-optic line, and other small projects (Butler 1990, 1991, 1992). In 1993, Metcalf Archaeologists surveyed a small portion of land in the southeastern part of the FCMR for the City of Colorado Springs. No cultural resources were located (Spath 1993).

Including the present field project, FLC has conducted five field seasons in the FCMR; the results are reported in this report plus four other documents (Charles et al. 1997; Charles et al. 1999a, 1999b; Charles et al. 2000). During the summer of 1995, FLC conducted an inventory of 1,460 acres on Booth Mountain. Results confirmed that site density was high, with a total of 35 sites and 78 isolated finds. This figure of one site per 42 acres was not expected, considering the harsh landscape and limited water resources. Of the 35 sites recorded, the most common site type is the open, flaked-lithic artifact scatter lacking features.

The second field season by FLC (1996) was divided between inventory and testing (Charles et al. 1999a). Inventory was conducted on 850 acres in separate areas of the FCMR. The inventory resulted in the identification and recording of 27 cultural properties, which included 16 historic and prehistoric sites and 11 isolated finds. In that same year, evaluative testing was conducted at a large multicomponent site near the Rod and Gun Club at the northwestern portion of the base. This site is a light surface scatter of prehistoric and historic artifacts and twenty-four stone features. Test units were excavated within four of the stone features, with additional test units excavated across the site but outside of the stone features. Testing resulted in the identification of buried, prehistoric cultural strata in two areas of the site. The surface structures were determined to be historic, mostly related to early military training operations. A charcoal sample from the buried component provided a calibrated radiocarbon AMS age of 570 ± 50 BP (Beta-104298: wood charcoal [Charles et al. 1999a:7.67]). There is a 95 percent probability that the calibrated age range falls between AD 1300 and AD 1435, which places the occupation during the Diversification period.

In 1997, FLC continued their cooperative agreement with MWAC and

completed a site reevaluation project (Charles et al. 1999b). Eighty-nine cultural resources within the FCMR were reevaluated. These 89 cultural resources comprised historic and prehistoric archeological sites located within the numerous military training areas across the base. Many of the sites had never been fully recorded and were merely accounts, made by early researchers in the area, of possible cultural resources. Attempts to locate the 89 cultural resources succeeded in accurately locating and identifying 76 (85%). Thirteen (15%) of the cultural resources were not relocated. The project concluded that 50 sites (56% of the resources evaluated) have the potential to yield information significant to the prehistory of the FCMR, as defined in the Cultural Resource Management Plan for Fort Carson Military Reservation (Zier et al. 1997). The remaining 38 sites (44%), which include 13 sites which were not located, were recommended as not eligible for nomination to the NRHP.

In 1998, FLC completed the inventory of 7,236 acres of FCMR. The inventory was divided between areas of probable high site sensitivity and those of medium site sensitivity, identified as such in the Historic Preservation Plan for FCMR (Zier et al. 1987). The areas inventoried included portions of three counties: El Paso, Fremont, and Pueblo. They are located on six United States Geologic Survey 7.5' quadrangle maps: Cheyenne Mountain, Fountain, Mount Pittsburg, Pierce Gulch, Timber Mountain, and Stone City. Four thousand and thirty-six acres of high site sensitivity areas and 3,200 acres of medium site sensitivity areas were inventoried. A total of 89 cultural resources were recorded, and 2 previously recorded sites were revisited and reevaluated, bringing the total number of sites to 91. Additionally, 86 isolated finds were recorded. The distribution of recorded sites was as follows: 74 (81%) prehistoric sites, 15 (17%) historic sites, and 2 (2%) multicomponent historic and prehistoric sites. Sixty-eight (75%) of the sites were recommended as not eligible for nomination to the NRHP, while the remaining twenty-three (25%) sites were recommended as eligible for nomination to the NRHP.

A historic buildings inventory by MWAC (Barnes 1991) documented over 200 buildings of World War II vintage located close to or within the cantonment. Most recently, the Old Hospital Complex (5EP1778) at FCMR has been fully documented by the National Park Service (Connor and Schneck 1996). This semi-permanent complex was constructed during WWII and consists of 59 buildings that functioned as wards, clinics, mess halls, support service centers, and administrative, recreation and utility structures.

In September of 1996, limited test excavations were conducted near the Mountain Post Sports Complex (Korgel 1996). A large vault packed with rusted metal was identified. The vault, believed to be part of a larger dump, was once associated with one of two historic ranch complexes. The report does not identify a specific time

period for the artifacts, and the exact origin of the dump is uncertain. No further work was recommended at this location. In that same month, test excavations were completed in the immediate area of Building 10010 of the proposed Turkey Creek National Register District. The purpose of the testing was to investigate the extent of impacts to any significant subsurface archeological deposits as a result of construction activities over the years. Subsurface testing was conducted in September 1996, and a report of the results was submitted to the National Park Service (Korgel 1996).

Recently, FCMR contracted a study by Jones et al. (1998) to identify the ties between native peoples and the reservation's lands and to determine strategies for future consultations. In addition, Jones et al. (1998:162) identified three types of traditional cultural properties (TCPs). The first comprises specific sites, such as rock art sites and burials. The second consists of areas of traditional use, such as gathering areas. The third is landscape features that may have been used for particular tribal activities.

A cultural resource inventory of 1,397.5 acres for upgrades and erosion control structures in the Range 155 maneuver boundary and safety fan resulted in locating and recording eight prehistoric sites (no historic sites were located) and nineteen isolated finds (Chomko and Schiavitti 2000). The inventory was conducted by archaeologists from the FCMR with crew members supplied by MWAC. Range 155 is located in the southeastern portion of FCMR in El Paso and Pueblo counties.

The recent work in the FCMR has produced two important reports published in refereed journals. In 1991, Zier and Kalasz published a synthetic site report of their excavations of the Recon John rock shelter in the *Plains Anthropologist*. A full report of their work is found in Zier (1989). This site is significant for the light it sheds on the transition between the Archaic and Woodland periods in this part of Colorado. Zier and a team of colleagues have also published in the same journal the results of testing at the Avery Ranch site, important for its information on subsistence and settlement patterns during the Apishapa phase (Zier et al. 1990). Watts (1971) had earlier produced a master's thesis (University of Denver) on this site. In 1985, a human burial (5PE773) was discovered in the southwest portion of the FCMR. This burial, which dates after 1,000 BP, was found by army personnel during training exercises. The results of the excavation of the burial are reported in *Southwestern Lore* (Butler et al. 1986).

CHAPTER 4
RESEARCH DESIGN AND OBJECTIVES

The federal legal criteria used in this evaluation are found in 36CFR60 and are as follows: the quality of significance in American history, architecture, archeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

A. that are associated with events that have made a significant contribution to the broad patterns of our history; or
B. that are associated with the lives of persons significant in our past; or
C. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
D. that have yielded or may be likely to yield information in prehistory or history.

Sites may have national, state, or local significance.

The *Colorado Plains Prehistoric Context* (Eighmy 1984: 48-49, 64-65, 77-78, 103, 142-143,152-153) provides criteria for each of the major cultural periods represented on the Colorado Plains that further assist in the evaluation of a site's significance and potential eligibility nomination to the NRHP. Further outline and direction for future research are provided in Zier and Kalasz (1999: 77-79, 81-84, 88-90, 96-99, 109-112, 122-125, 137-140, 181-188, 239-249, 259-262, 268-269). Of lesser importance to the project area are the research problems identified for the mountains and foothills by the *Colorado Mountains Prehistoric Context* (Guthrie et al. 1984: passim) and the *Colorado Southern Frontier Historic Context* (Mehls and Carter 1984: passim).

This present work also conforms to the Historic Preservation Plan mandated for all Army installations under U. S. Army Regulation (AR) 420-40 (Department of the Army 1984:2-1):

1. To integrate historic preservation requirements with the planning and conducting of military training, construction, other undertakings, and real property or land use decisions;

2. To set up a legally acceptable compliance procedure with the Advisory Council on Historic Preservation (ACHP) and the State Historic Preservation Officer (SHPO);

3. To set priorities for field, analytical, and documentation projects that are designed to develop, evaluate, and manage the inventory of significant historic properties;

4. To establish a procedure for evaluating historic properties;

5. To provide guidelines for the protection or treatment of historic properties; and

6. To identify funding, staffing, and milestones.

The FCMR Historic Preservation Plan (HPP) was prepared in 1987 (Zier et al. 1987) by Centennial Archaeology (Fort Collins, CO), Cultural Research and Management (Bismark, ND), Statistical Research (Tucson, AZ), and Kenneth Weber (Boulder, CO). This document provides a comprehensive synthesis of all cultural resources on the base, places these data into a regional context, and offers a detailed plan to ensure the army's compliance with its mandates regarding the correct treatment of cultural resources on army property. Specifically, the FCMR HPP "provides cultural resource managers with pertinent background about the prehistoric and historic resource base while outlining procedures for dealing with the resources so that the requirements of applicable historic preservation statutes are fully met" (Zier et al. 1987: 1-2).

Most recently the HPP has been replaced by the Cultural Resources Management Plan (Zier et al. 1997). The purpose of the Cultural Resources Management Plan (CRMP) is to "identify and evaluate known cultural resources on the FCMR and to place these resources within their respective culture-historic context; to make predictions about the nature of undiscovered sites while providing criteria for their eventual evaluation; and to develop, on a priority basis, objectives and procedures for long-range management of resources that take into consideration both the goals and the day-to-day requirements of military training" (Zier et al. 1997:I-i).

Under the CRMP, six prehistoric site types and eight historic site types have been identified on the FCMR. The prehistoric site types include: prehistoric open occupation hearth sites, prehistoric open sites lacking features, prehistoric open structure sites (alignments, enclosures, and wickiups), prehistoric sheltered sites, prehistoric rock art sites (petroglyphs and pictographs), and prehistoric human burial sites. Historic site

types include historical town sites, historical mining and quarrying-related sites, historical transportation network sites, historical homesteading/agriculture-related habitation sites, historical homesteading/agriculture-related nonhabitation sites, historical human grave sites, and historical military-related sites. An eighth category includes unique historical sites, such as historical rock art inscription, which do not easily fit into the previously mentioned site types.

As part of the CRMP for the FCMR, Zier et al. (1997) identified nine research themes that would be addressed through future archeological work on the base. These include: (1) chronology and cultural relationships, (2) settlement patterns, (3) the nature of prehistoric economics, (4) horticulture, (5) paleoclimates, (6) technology and material culture, (7) architecture, (8) rock art, and (9) geomorphology. Prehistoric sites that may yield information significant to the prehistory of the FCMR include: (1) Pre-Paleo Indian and Paleo Indian sites, (2) Early Archaic period sites, (3) sites with substantial *in situ* buried deposits, (4) stratified multicomponent sites, (5) architectural Developmental and Diversification period sites, (6) Protohistoric structural sites, (7) communal kill sites, (8) intact rock art sites, (9) complex lithic material quarries, and (10) unique aboriginal sites (Zier et al. 1997:II-110-112).

Prehistoric site types regarded as not significant and, therefore, generally ineligible for NRHP inclusion are isolated artifacts, isolated nonarchitectural features, artifact scatters restricted to the surface, sites damaged by natural or man-induced causes to the extent that physical integrity is limited, and rock art sites that are eroded or which exhibit only hypothesized tool-sharpening grooves (Zier et al. 1997: II-112).

Research themes established for the historic period of FCMR include the following: homesteading and agricultural settlement, mining, and military occupation and training (Zier et al. 1997:II-94-100). Historical resources generally considered to be significant include: sites associated with the fur trade early exploration and pre-1880 military activities; open range ranching sites; original homestead or ranching structures; sites that contain unique or outstanding examples of architectural styles, periods, construction techniques, materials, or craftsmanship; homestead settlement sites; sites that exhibit historically important engineering features or industrial processes; and post-1942 military sites and structures. Sites generally recommended as not eligible for NRHP inclusion are isolated agricultural sites of the post-1900 period, settlement sites which retain poor integrity, and isolated artifacts (Zier et al. 1997:II-113-114).

Expected Results

Equipped with prior knowledge of the environment and the nature of archeological sites within the FCMR, it was anticipated that the archeological sites

tested could be divided into two primary site types—open sites and sheltered sites. The open sites would more likely be associated with single-component later occupations such as the Developmental and Diversification periods, while the prehistoric sheltered sites would be more likely to represent stratified sites with the potential for deeply buried prehistoric occupations. The protection from the elements afforded by the sheltered sites also made them good candidates for radiocarbon samples and faunal and floral remains. Structural remains, however, would occur with more frequency on the open sites that dated to the Late Prehistoric stage, specifically the Developmental and Diversification periods.

With the background from many years of federally mandated cultural resource projects that have taken place on the FCMR, it was predicted that the Late Prehistoric stage would be the most common time period represented in our sample. Additionally, sites on Booth Mountain provided us with unfamiliar territory since there has not been any subsurface testing beyond minor shovel or trowel testing (Charles et al. 1997; Charles et al. 1999b; Zier et al. 1996) at any sites on the top and slopes of Booth Mountain. Several rock shelter sites have been tested along the Turkey Creek drainage (Kalasz et al. 1993; Van Ness et al. 1990; Zier 1989), along the mesa tops east of Turkey Creek (Kalasz et al. 1993; Van Ness et al. 1990; Zier et al. 1988; Zier and Kalasz 1985), and open sites within the alluvial bottoms of Turkey Creek (Hartley et al. 1983; Van Ness et al. 1990), but to our knowledge, no substantial testing had been conducted on sites within the interior of Booth Mountain. Sites that were selected for testing on Booth Mountain consisted of open flaked- and ground-stone artifact scatters and small sheltered sites. The potential for sediment depth and buried cultural deposits would be greatest in the shelters, but open sites, given the right geomorphological situations, could hold the potential for buried deposits.

CHAPTER 5
FIELD AND LABORATORY METHODS

Introduction

Field methods and techniques on the project were consistent with the procedures established in Dean (1992:IV-22) for site testing and excavation. The reader is referred to this document for more detail on the excavation techniques used for the project. The purpose of this project was to evaluate the potential of each to yield significant information about the prehistory of the FCMR. Criteria for this evaluation were established through discussions with Steve Chomko, FCMR archaeologist, prior to beginning field work. When eligibility had been clearly determined, site investigations were terminated.

Field Methods and Techniques

Surface Investigation

Each site was inventoried for surface artifacts prior to conducting subsurface testing. This was done to better define the site boundaries and features and to locate the tools. Several procedures were followed once arriving at the site. A general reconnaissance of the site area was conducted. This allowed the crew to orient themselves while trying to relocate the site datum, previously documented tools, and cultural as well as natural features. The crew then lined up near one edge of the site and walked systematic transects across the site at two meter intervals. Systematic transects were not practical on sites 5PE750 and 5PE1803 due to their large size. All prehistoric artifacts and features were pin-flagged at the majority of the sites. Because of the large number of artifacts at three sites (5PE750, 5PE1785, and 5PE1803), all tools, features, and a sample of 150 flakes were flagged. Site boundaries were defined at all sites. Flaked-lithic tools, manos, and ceramics were collected for analysis in the lab. Non-tool debitage, and nonportable groundstone and cores were recorded in the field. Because all the sites in our sample had updated State of Colorado Site Forms, only the State of Colorado Site Reevaluation Form was completed for each site.

Mapping

If the original site datum remained in place at the site, which was the usual circumstance, then the Topcon electronic Total Station (GTS 210 series) was stationed over the existing datum. However, if the original datum was not located or if it was in an area with low visibility, the Total Station was placed as near as possible to the

position of the original datum as inferred from the site map. Temporary mapping stations or subdatums were placed in areas determined to have the best position from which to map the site. If the original datum was a piece of PVC pipe, it was replaced with a piece of rebar. If a metal site tag was not present, the Smithsonian site number was stamped into a metal site tag and attached to the rebar datum. A Trimble Geo Explorer II global positioning system (GPS) was used to locate the site datum, boundaries, and topographic as well as cultural features. One hundred and twenty data points were recorded at the datum of each site.

Each site was mapped with the Total Station. The position of the datum was arbitrarily set at 100 meters north (100 mN), 100 meters east (100 mE), and the elevation at datum was 100 meters (100 m). In the case of 5PE750, the datum was set at 200 m N, 200 mE, and 100 m in elevation to map the entire site area. The Total Station was aligned to true north.

Mapping points included all tools, ceramics, features, shovel tests, test units, site boundaries, and general topography. On sites with a small surface artifact assemblage, all the visible artifacts were mapped with the Total Station.

Subsurface Testing

Shovel Tests

Shovel testing, which played an essential role in the evaluative testing, was conducted under the guidelines specified in the PCMS field and laboratory manual (Dean 1992). Shovel tests were placed along angle lines (i.e., 180°, 90°, etc) and spaced every four meters apart. The average diameter of a shovel test was 35 cm. Each shovel test was excavated to bedrock, to culturally sterile substrata, or until the test hole could no longer be dug without expanding the diameter (usually around 70 cm deep). The sediments were screened through ¼" wire mesh, and all artifacts were collected. Shovel test data, which included diameter, depth, materials recovered, and stratigraphic description, were recorded on auger/shovel test forms. All shovel tests were backfilled upon completion. This information is summarized in Appendix II.

Test Units

Test unit excavations followed the guidelines set forth in the field and laboratory manual for testing and excavations (Dean 1992). Excavation units were placed selectively across the sites. Test unit placement took into account information from various sources including shovel test results, surface artifact distribution, feature investigations, surface stability, and the potential for significant sediment accumulation.

At least one test unit was placed in or in front of the shelters at the four sites with shelters. Once cultural deposits had been clearly determined and eligibility established, excavations were terminated.

Test units were 1-x-1 m in size. Vertical control consisted of excavating in 10-cm levels within identified stratigraphic layers (natural or cultural). The test units were usually set up on true north, and the corners were mapped with the Total Station. The test units were backfilled, and the sod layer was replaced at the end of testing.

Sediments from all units were screened through ¼" wire mesh. Artifacts collected from each level were assigned unique field specimen numbers. Artifacts found *in situ* were mapped in place in the unit and assigned point provenience numbers and a unique field specimen number. A 33- x 33-cm control sample (1/9 of the level) from each level or layer was retained for waterscreening through 1/16" hardware mesh, which was conducted in the laboratory at FLC. In addition to the control samples, flotation, soil, pollen, and radiocarbon samples were collected as appropriate. All control samples collected from within the shelters were saved for flotation.

Field Recording

Field work was recorded on the appropriate PCMS/FCMR forms. Ancillary FLC forms were used for field specimen inventories, stratigraphic descriptions, and photographic descriptions. Black-and-white photographs were taken throughout the testing as were digital photographs. Photographs were taken of at least two walls from each unit. Site overview photographs were taken as well.

Stratigraphic descriptions of all profiles and features included information on pedogenic structure, Munsell color, soil texture, inclusions, reaction to hydrochloric acid, evidence of burning, soil horizon designation, percentage of gravels, stratum thickness, and evidence of cultural features or artifacts. Several terms were used throughout the field recording to delineate the stratigraphic units. The nomenclature adopted in the field was carried over into the report descriptions. These terms are defined below.

Layer	A stratigraphic unit, usually horizontal, and often defined in profile; often consisting of similar sediments containing evidence of human occupation, but not necessarily *in situ* deposits. Layers were determined while excavating and, therefore, do not always cohere with the strata defined in profile and after the unit was completed.
Level	Arbitrary unit of excavation, usually 10 cm.

Stratum — A stratigraphic unit, usually horizontal, and defined in profile, often, but not always, consisting of sediments lacking evidence of human occupation. Strata are numbered sequentially from top to bottom and are usually consistent across the site. A stratum is a distinctive body of sediments or bedrock that is differentiated from overlying, underlying, or adjacent strata on the basis of physical appearance. They can vary in thickness and geographic extent but must be mappable or traceable for long distances, usually beyond the boundaries of the site.

Ethnostratigraphic Unit — A unit of cultural material whose artifacts must be only those artifacts whose age of manufacture or use is contemporaneous with the age of deposition of the stratum. In other words, the cultural material must be *in situ* and dated to the same time period as the sedimentary deposit.

Field Artifact Analysis

Flaked-lithic Debitage

Flaked-lithic analysis of debitage was conducted in the field. On sites with less than 150 pieces of flaking debris, the entire surface assemblage was analyzed. Sites with greater than 150 pieces of flaking debitage were nonrandomly sampled, and a minimum of 150 flakes or shatter were analyzed. Analysis followed the classification system developed by Ahler (1997) for the PCMS. To be consistent with previous flaked-lithic analyses at the FCMR, debitage was also categorized under the Sullivan and Rozen (1985) classification system. Data on the flaked-lithic debitage were recorded in Sharp Palmtop portable computers, which were downloaded each night into the laptop computer. Flakes were recorded by raw material type, flake type, presence or absence of cortex, and size grade.

Material types, based on Ahler (1997), identified in our sample include: chalcedony, chert, orthoquartzite, quartzite, limestone, silicified wood and basalt/hornfels. Siltstone was added to Ahler's material types.

Four categories of flaking debris were recognized in accordance with Ahler (1997): shatter, simple flake, complex flake, and bifacial thinning flake. These flake types, as defined by Ahler (1997), are defined below.

Shatter A generally angular piece of flaked and flakeable stone that lacks any feature which will allow determination of dorsal or ventral surfaces or any determination of direction of force reduction.

Simple Flake A freehand percussion or pressure flake that exhibits parts of no more than two previous flake scar facets on the dorsal surface (exclusive of small platform trimming/shaping flakes). A simple flake may or may not retain the platform.

Complex Flake A freehand percussion or pressure flake that lacks the specialized features of a bifacial thinning flake but which does retain all or parts of three or more previous scar facets on the dorsal surface (exclusive of small platform trimming/shaping flakes). Complex flakes may or may not retain the platform.

Bifacial Thinning Flake A technologically specialized flake removed from a biface during mid to late stages of thinning. Bifacial thinning flakes retain a combination of most of the following attributes: a platform, which is a fragment of a bifacial margin (linear and faceted); lipped platform; flat, very thin cross-section (transverse and longitudinal); feathered, low-angle lateral margins and termination; slight curvature in longitudinal section; multiple dorsal scars; dorsal scars, which converge from different directions; and little or no cortex.

Size grades used in this project were adapted from Ahler (1997). Flakes were size graded with the aid of three, small-hand screens (½" and ¼"). Flakes greater than 1" were classified as Grade 1, flakes greater than ½" and less than 1" were classified as Grade 2, and flakes smaller than ½" were classified as Grade 3.

Flake characteristics are used to infer stages of reduction, i.e., initial core reduction to final tool production. It is assumed that higher percentages of simple flakes occur during the early to middle stages of reduction activities. Complex flakes occur during middle stages of reduction, the first half of shaping and tool production, but are more common in later stages of reduction, the last half of shaping and tool production of unifacial and bifacial tools. These basic premises are in part based on experimental data reported by Magne (1985). Experimental studies by Ahler (1989) on samples of Knife River Flint suggest that bifacial thinning flakes are associated with later stages of bifacial reduction, but are rare or absent in other technologies and reduction stages (Ahler and Smail 1999). The differences in raw material types at the FCMR compared with those from the above-mentioned studies may produce minor interpretive incompatibilities between the data sets.

Additionally, flaked-lithic artifacts were categorized using the method developed by Sullivan and Rozen (1985). This method is consistent with the analysis of lithic

artifacts from the Recon John shelter in Turkey Creek (Zier 1989) and from other inventories (Charles et al. 1997; Charles et al., 1999a, 1999b; Kalasz et al. 1993; Zier et al. 1996). In this classification system, debitage is sorted into four categories by means of a simple key of dichotomous technological attributes (Sullivan and Rozen 1985:759). This approach to debitage analysis is designed to *describe distinctive assemblages of artifacts* rather than the more traditional analysis, which *describes assemblages of distinctive artifacts*. Furthermore, Sullivan and Rozen (1985) argue that most debitage analysis is based on the assumption that technological origins can be identified from key attributes alone, when, in fact, the technological origins of most artifacts cannot be individually determined because reduction often proceeds as a continuum rather than as a sequence of discrete stages.

In the Sullivan and Rozen classification system, the lithic debitage is separated into four categories: debris, flake fragments, broken flakes, and complete flakes. Complete flakes are separated from all other debitage on the basis of the following characteristics: single interior surface, striking platform (point of applied force or impact), and intact margins. A single interior surface is indicated by ripple marks, force lines, or a bulb of percussion. A point of applied force is indicated by an intact striking platform or by the origin of force-line radiation where only a fragmentary striking platform remains. Margins are intact if the distal end exhibits a hinge or feather termination, or if lateral breaks or snaps do not interfere with accurate width measurements. Broken flakes have all the characteristics of a complete flake, except that broken flakes do not have intact margins. A flake fragment has a single interior surface but no striking platform or intact margins. Debris has none of the three defining characteristics of a flake.

Under Sullivan and Rozen's (1985) classification system, the relative frequencies of flake types represented at the sites are used to infer stages of lithic technology, core reduction and/or tool manufacture. Under this classification system, it is implied that complete flakes and debris indicate stages of core reduction, while broken and flake fragments represent the by-products of tool manufacture.

Groundstone

Previously unrecorded groundstone artifacts that were too large to be carried from the site or too fragmentary to be of much additional benefit were recorded on PCMS/FCMR nonportable groundstone forms and left. Portable groundstone, such as manos, were collected for analysis.

Laboratory Methods and Techniques

Laboratory methods for the project followed those prescribed in the PCMS manual (Dean 1992). These specifications were rigorously followed throughout the laboratory analysis. All artifacts were washed, cataloged, labeled, rebagged, and attribute analysis was recorded on the appropriate PCMS/FCMR forms. Personnel from FLC analyzed the flaked-lithic artifacts, the groundstone, and the nonhuman faunal remains.

The 33-x-33 cm control samples collected from each excavation level were waterscreened in the laboratory. These samples were waterscreened through 1/16" mesh. These control samples were used to recover smaller cultural material normally lost during dry screening with ¼" mesh.

Flotation Samples

Several samples were collected from excavation units for flotation in the FLC laboratory. These samples included all feature fill and all control units collected from rock-shelter sites. The sediments were processed in a flotation device. Both light and heavy fraction materials were sorted, and macrobotanical remains collected as light fraction were submitted for analysis.

Macrobotanical Samples

Flotation samples collected for macrobotanical analysis were processed in the lab at FLC with a Sandy flotation device. The light fraction was dried, and charcoal for radiocarbon analysis was extracted if applicable. The samples were rebagged and were delivered to Meredith Matthews at San Juan Community College for identification. The results of this analysis are presented in Appendix VI.

Soil Samples

Soil samples were collected for further textural division in the laboratory. The procedure for separating sediment sizes and determining textural percentages was accomplished with a LaMotte soil texture unit, which consists of three 50-ml test tubes, texture-dispersing reagent, and a soil-flocculating reagent. The test is designed as a simple way to separate sediments into three basic size fractions: sand, silt, and clay. The amount of time required for the sediment particles of various sizes to settle in the separation tubes forms the basis for the test. From the amount of sediments collected in each tube, it is possible to determine the approximate percentage of each fraction and thus determine the texture.

Radiocarbon Samples

Charcoal was collected in the field and from the fine-screen flotation samples for ^{14}C dating. Radiocarbon samples were submitted to Beta Analytic Inc. for dating (Appendix VII).

Flaked-Lithic Artifacts

Flaked-Lithic Tools

For coding purposes, flaked-lithic artifacts were divided into the following categories: bifaces, flake tools, cores, complete flakes, and broken debitage (Dean 1992). Additionally, the flake tools were further separated into patterned and unpatterned flake tools (Ahler 1997). An unpatterned flake tool is a flake tool where one or more edges has been culturally modified, and in which the tool outline is largely a product of flake shape as opposed to patterned tool in which the outline is created by the knapper (Ahler 1997). Patterned flake tools include bifaces, projectile points, and scrapers. Unpatterned tools consist of retouched flakes and utilized flakes. Other stone tools, which have been culturally modified, are discussed as a separate category. These tools include choppers, cores, tested cobbles, and hammerstones. Quantitative data on all tools and cores are provided in Appendix III

Raw material classification was based on Ahler (1997). Measurements were taken for the maximum length, width, and thickness whenever possible. Weight was measured on all tools except for cores, which were analyzed in the field.

Patterned Flake tools

Bifaces Bifaces consist of broken and complete specimens. The description of these items utilized general terms derived from Ahler's (1997) tool techno-morphological classes. Unfinished bifaces are bifaces in which manufacture does not appear complete. Thin or thick bifaces are related to the stage of reduction. Large and small (arrow point size) bifaces are also a way to separate bifaces in terms of size. Additional information includes a physical description of biface shape or portion, weight, and the size sorting. Common shapes include oval and lenticular. A lenticular-shaped biface is defined as narrow and pointed at the proximal end with a broad, rounded distal end.

Projectile Points Descriptive terms for morphological attributes of projectile points were taken from Lintz and Anderson (1989). Measurements, such as blade length, blade width, stem width, stem length, and base width were made whenever

possible regardless of whether or not the haft element was complete. The collected projectile points were compared to Fulgham and Anderson (1984), Lintz and Anderson (1989), Loendorf et al. (1996), Loendorf and Loendorf (1999), and with other reports from the FCMR/PCMS. Additionally, reports from the FCMR were used for comparison. These include Alexander et al. (1982), Charles et al. (1997) Charles et al. (1999a, 1999b), Hartley et al. (1983), Jepson et al. (1992), Kalasz et al. (1993), Van Ness et al. (1990), Zier and Kalasz (1985), and Zier et al. (1996). As needed for specific information, the following sources were also consulted: Gunnerson (1989), Irwin and Irwin (1959), and Perino (1971).

Diagnostic attributes, including overall size and hafting morphology (stemmed or flanged, base shape, tang, and shoulder characteristics), provided a means to visually compare projectile point types and determine any similarities. As with all nonstatistical projectile point comparisons, the results are somewhat subjective. Based on morphological similarities with projectile points from dated contexts, relative dates were assigned to the points whenever possible. All projectile points from each site were examined to establish a base-line date for that site or to add to an existing one. Other data were used to assess site dates, such as the presence of ceramics, structures, and perhaps more importantly radiometric dating.

Scrapers Scrapers were examined in accordance with Dean (1992) and were size sorted. The results of the analysis are presented in Appendix III. The angle of the beveled edge of the scrapers was measured using a goniometer. The angle listed is the average of several measurements along the beveled end of the scraper. The relatively flat and ventral side of the scraper represents 0°. The angle of the bevel is the angle between the plane of the ventral surface and the angle of the beveled edge. A 90° angle is a right angle to the ventral surface. The weight, material type, use wear, size measurements, and presence of cortex were also recorded

Unpatterned flake Tools

According to Ahler (1997), unpatterned flake tools are tools with modified edges in which the tool outline is largely a product of flake blank shape rather than intentional modification. These tools were also classified following the standards in Dean (1992). Retouched flakes and utilized flakes fall under this category. The flake tools were sorted by size and weighed. Completeness, material type, presence of cortex, and the type of modification was also recorded

Other Stone Tools

These tools include choppers, cores, tested cobbles, and hammerstones.

Choppers were weighed and measured. The number of flakes removed along the modified edge and the presence or absence of use wear were recorded. Cores were measured, and the presence of cortex was noted. The directional application of force was also documented. The tested cobbles and hammerstones were measured and weighed. Raw material types were recorded for all these tools.

Flaked-Lithic Debitage

These artifacts were classified by the debitage systems described in the field methods section of this report. Data from subsurface flakes were combined in a table with the data collected from the surface flakes. This table was used to make general interpretations as to the lithic-reduction techniques practiced at each site.

Prehistoric Ceramic Artifacts

Ceramic artifacts were collected from one site, 5EP1080. These artifacts were analyzed by Dr. Richard Krause, University of Alabama. Laboratory methods and results of ceramic artifact analysis are included in Appendix I of this report.

Faunal Remains

Faunal material was analyzed by Dr. Philip Duke of FLC. Faunal remains were cleaned with warm water, dried, and then bagged according to field specimen number. Analysis of the individual pieces was made by reference to the comparative faunal collection in the Department of Anthropology at FLC. An attempt was made to assign to each piece the following attributes: skeletal element, portion of element, side of element, age at death, human modification, and nonhuman modification (e.g., weathering or animal gnawing). In most instances, because of the severe fragmentation of the pieces, species identification was not possible above the level of family. In these cases, they were classified as either small (dog-sized), medium (deer-sized), or large (elk- or bison-sized) mammals. For a similar reason, element identification and age at death was very difficult to determine. Complete or near-complete bones were measured (length, width and thickness in millimeters), and whenever feasible their weight was taken (in grams). In the case of highly fragmented bone pieces, the weight of the total assemblage by level was taken.

Groundstone

Analysis followed the FCMR laboratory methods outlined in Dean (1992) and consisted of the quantitative measurements of the artifact dimensions as well as qualitative analysis including the assessment of completeness, and the determination of

the material type, the number of surfaces, the presence of battering, and indications of edge grinding. Although this analysis establishes the preparation and morphology of the artifact, further examination was required to establish use wear patterns following Adams(1996).

Portable and Nonportable Groundstone

Additional analysis was not conducted on the metates or larger grinding stones because a nonportable groundstone form was filled out on them and they were left in the field. The nonportable groundstone form is restricted to analysis emphasizing only morphology with the exception of striations. It establishes completeness (condition), type, form, shaping, material type, and size (length, width, thickness), and describes characteristics of each grinding surface if there is more than one. This includes the surface size, shape, presence and direction of striations, and the presence of polish, pitting/pecking, and smoothing.

Several other variables were studied following Adam's analysis outline (Adams 1996: Appendix B). The condition of the artifact was determined, which establishes the overall wear of the entire artifact. The surface configuration describes the shape of the artifact's surface, and the surface wear describes the actual use of the artifact's individual surface(s). The surface texture defines the coarseness of the grains of the material type on each surface. The wear type indicates the microscopic wear on the grains of the material type on each surface. Contact type is derived partially from the wear type, as well as the spaces in between the grains. This reveals what type of material the grinding stone would be coming into contact with (e.g., stone, leather). The stroke refers to what kind of motion was applied in the use of the artifact. Residues like caliche and charcoal were recorded, as well as the weight of the artifact.

Survey and Mapping

The geographic data collected from the Trimble GPS units in the field were downloaded into the Pathfinder Office Software. The UTM (Universal Transverse Mercator) data points were differentially corrected in Pathfinder Office and the georeferenced information was loaded into AutoCAD and later into ArcView. The locational maps were produced in ArcView, a mapping program from ESRI. While the site maps were created in AutoCAD, a drafting program from Autodesk, Inc., c contours for the site map were created from Total Station information that was brought into Surfer 7, a contouring and surface mapping software program from Golden Software, Inc. Profile maps were created in CorelDRAW 7 and all profiles are measured to below site datum (bsd) or above the site datum (Asl).

Cataloging and Database Management

Procedures for cataloging artifacts for FCMR/PCMS are specified in two manuals: *Fort Carson Curation Notebook and Artifact Database Documentation* (Mueller and McBride 1995), and *Guidelines to Required Procedures for Archeological Field and Laboratory Work at Pinon Canyon Maneuver Site, Las Animal County, Colorado* (Dean 1992). The two procedures are noticeably different, and their respective databases are not comparable. At this time, solutions are currently under review to correct this disparity. In the meantime, the catalog system developed by Mueller and McBride (1995) for the FCMR catalog system was used for this project.

Artifact data collected on PCMS forms was entered into Microsoft Excel and Access. This information will be available to the FCMR and the Army in electronic and hard-copy versions

CHAPTER 6
5EP1080
The Winterfat Site

Introduction

The Winterfat site (5PE1080) was chosen as the first site to test for the following reasons: (1) this large site would need considerable subsurface and surface exploration in order to determine eligibility (which would provide excellent training to the student crew members on the evaluation process), and (2) this site was experiencing significant impact to its integrity as a result of vehicular and pedestrian traffic, and was deemed in need of immediate evaluation (Charles et al. 1999b:6.21).

Site 5EP1080 is a large (6,573 m^2), prehistoric, open hearth site. The site was first recorded in 1988 (Jepson et al. 1992). The site was described as an extensive open campsite with ceramic, flaked-lithic, and ground-stone artifacts. Temporally diagnostic artifacts included projectile points and pottery. It was noted that well over 100 artifacts were present on the surface and eroding from the shallow cutbank. The site was considered eligible for nomination to the NRHP because of the density and variety of surface artifacts and because it held the potential for substantive surface deposits. Additionally, Jepson et al. (1992:275) suggested that this site could yield significant information on the themes of chronology and cultural relationships, settlement patterns, subsistence, and technologies as defined in the HPP (Zier et al. 1987). At the time of its original recording, it was believed that the site represented the only large campsite known on the Little Fountain Creek drainage within the FCMR.

In 1997, FLC returned to the site as part a cultural resource reevaluation project (Charles et al. 1999b). No datum was located, so a new rebar datum with a stamped tag was established as close to the original datum as could be ascertained from the site map. During the revisit, three ceramics, a biface, a preform, and a projectile point were collected (Charles et al. 1999b:6.21). Diagnostic artifacts collected from these two recording sessions indicated that the site was occupied during the Developmental and Diversification periods. During the 1997 revisit, a recent fighting position (fox hole) showed sediment depth to be at least 40 cm, while a dark, charcoal-enriched stain exposed in the road cut was interpreted to be a midden. In the middle of the road cut were two features, both charcoal-enriched. Three manos, two complete and one fragment, were close by and in the area of oxidation and charcoal. This feature was interpreted to be the remains of a hearth. The site was determined to possess significant research potential under the themes of prehistoric settlement systems and economies,

chronology and cultural relationships, and possibly horticulture, as defined by Zier et al. (1997). Management recommendations included avoidance, testing, and data recovery (Charles et al. 1999b:7.2).

The site is situated along a low north–south trending toe slope above Little Fountain Creek (Cheyenne Mountain, U.S.G.S. 7.5' quadrangle [Figure 6.1]). Little Fountain Creek flows west to east and is immediately north and adjacent to the site. Elevation at the site is 5,640 ft (1,719 m) asl. The site is in the open plains near the east end of the FCMR. A new training area, Range 104, for laser tanks is just south of the site. The site extends beyond the low toe slope and onto the slopes on either side, continuing down to the alluvial floodplain above Little Fountain Creek (Figure 6.2). Vegetation at the site mostly reflects its open plains ecological environment. Species noted at the site include winterfat, narrow-leaf yucca, prickly-pear cactus, skunkbrush, sunflower, fringe sage, a few juniper trees, and various short prairie grasses. Cottonwoods grow in the riparian areas along the drainage. A well-used, two-track road bisects the site in an east–west direction, and a fighting position is present within the site's boundary. Other than these recent human disturbances, which have compromised the site, it is in stable condition.

Surface Investigations

The 1999 surface investigation began by walking 2-m-wide transects, flagging all prehistoric artifacts and features. Near the end of the surface inventory, probable human remains were identified by a student crew member. Randy Nathan and Mona Charles visually examined the remains and notified Melissa Connor from MWAC, who was on site, of the probable human burial. Melissa Connor agreed that the remains were human, and she notified Steve Chomko by telephone of a possible "NAGPRA" issue. Later that afternoon, Steve Chomko examined the remains, acknowledged that they were human, and instructed the crew to flag a 60-m-diameter circle around the remains. The burial was removed by Chomko and Vince Schiavitti from DECAM. Although the burial is probably temporally associated with this site, the results of this excavation and analysis will be reported under a separate title.

After determining the site boundary, survey points were collected with the Total Station, and a site map was created (Figure 6.3). A total of 131 flaked-lithic artifacts was field-analyzed, and all visible tools and pottery were point-provenienced and collected. These included ten sherds, four scrapers, one utilized flake, two bifaces, three manos, three retouched flakes, and a projectile point, all of which are discussed in the material culture section of this chapter.

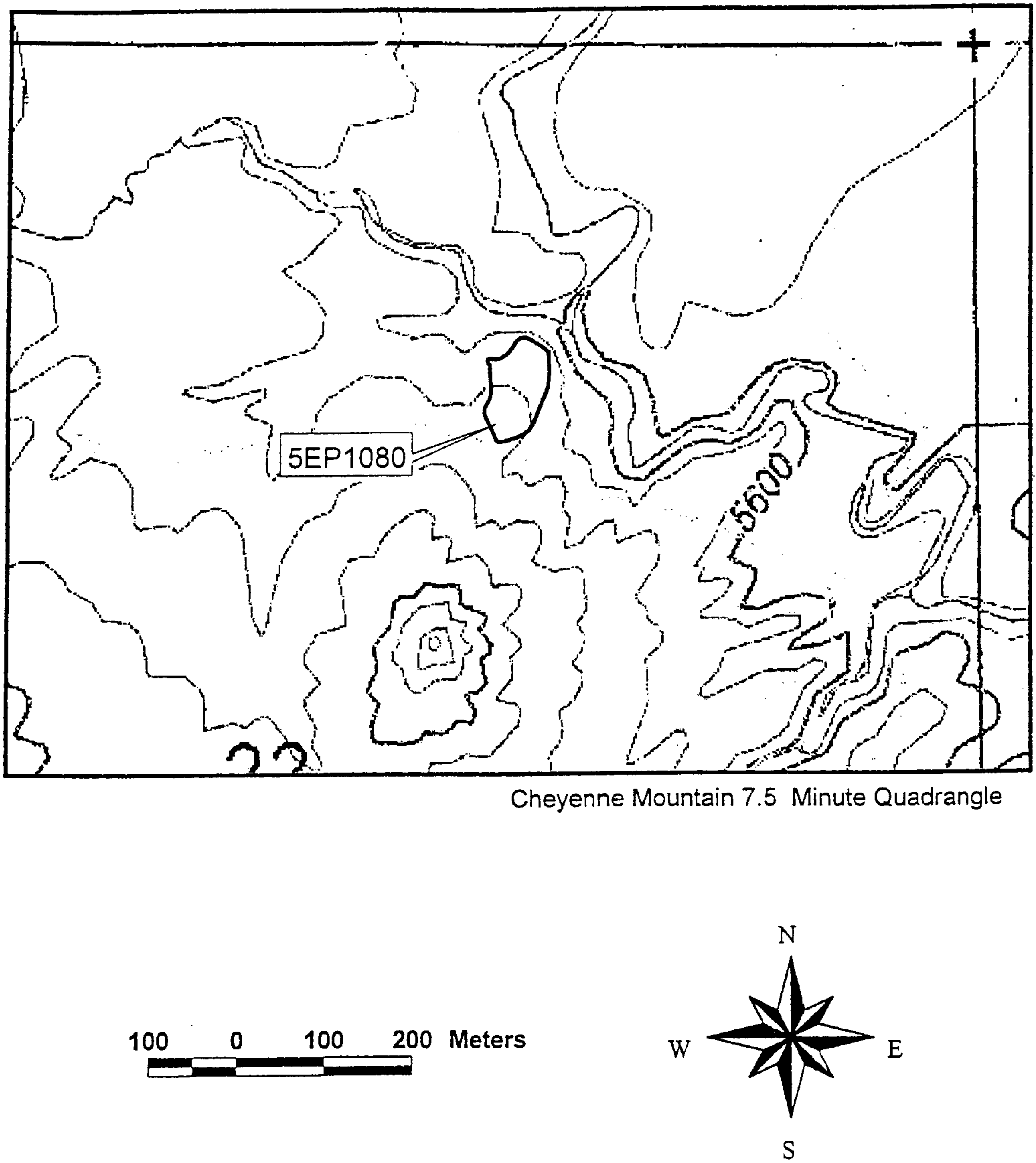


Figure 6.1. Location map, 5EP1080, FCMR.

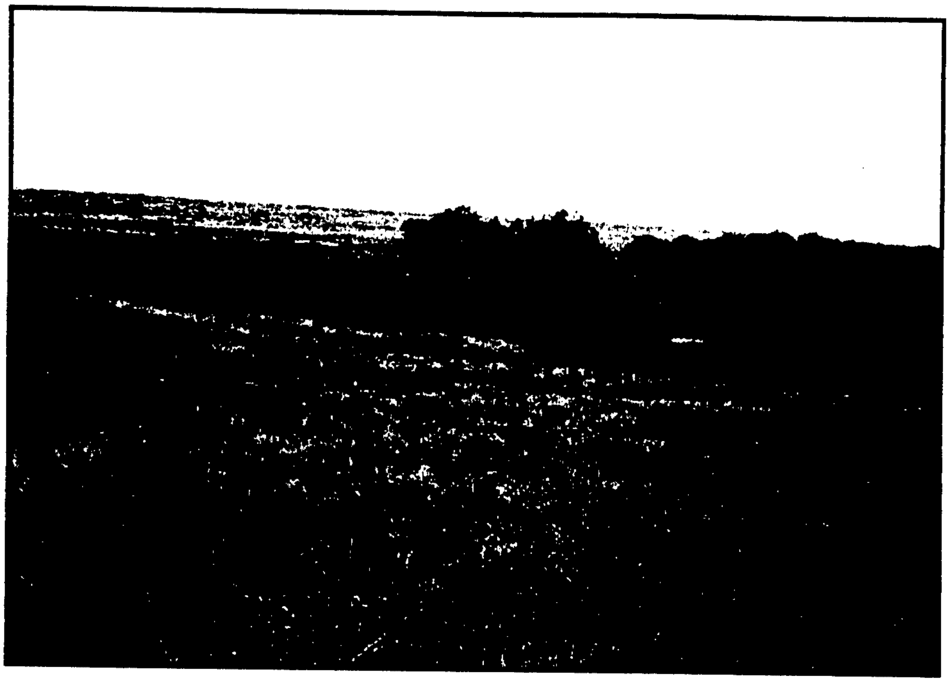


Figure 6.2. Site overview, 5EP1080, FCMR. View is to the east.

Subsurface Investigations

Thirty-eight shovel tests and three test units were excavated at the site.

Shovel Tests

Thirty-eight shovel tests were excavated in four lines across the site with shovel tests separated from each other by four meters. The shovel tests were excavated to culturally sterile sediments, to bedrock, or until the test hole could no longer be excavated with the available equipment (~70 cm). The first and longest shovel test line ran parallel with the long axis of the site from north to south along the top of the ridge. Twenty-one shovel tests were excavated in this line. A second line began on the north side of the two-track road and ran down the ridge line, which angled northeast from the first line. In this line five shovel tests were excavated. The third shovel test line ran perpendicular to the first line of shovel tests, crossing at Shovel Test 11. Ten shovel tests were excavated in this line, which ran from west to east across the top of the ridge. The last shovel test line was placed east of the first shovel test line at the junction of Shovel Test 20. Sixteen (42%) of the 38 shovel tests produced subsurface artifacts. Detailed stratigraphic descriptions of the shovel tests are provided in Appendix II.

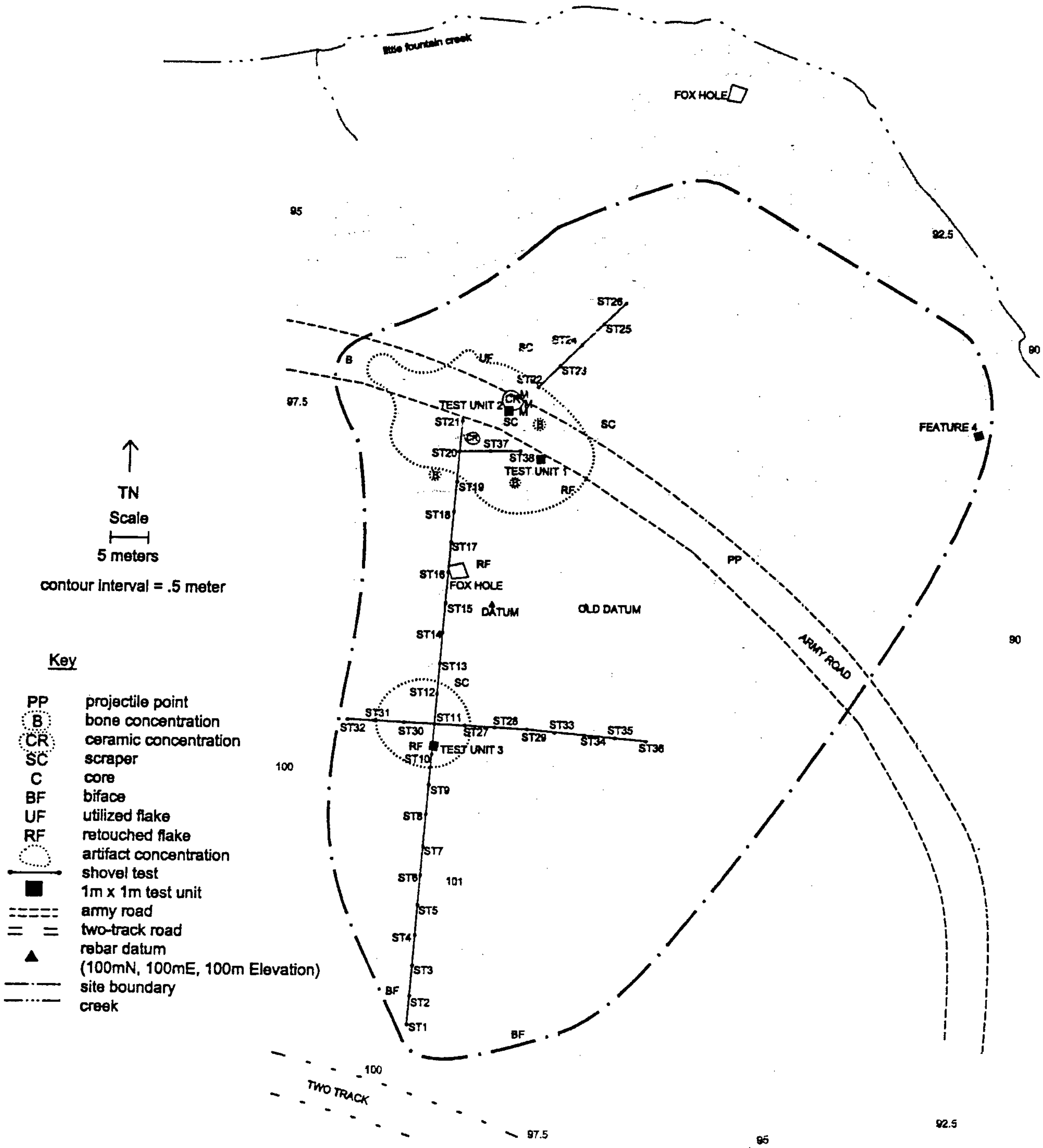


Figure 6.3. Site map, 5EP1080, FCMR.

Test Units

Three 1-x-1-m test units were excavated at this site, which accounted for less than 0.01% of the total site area. Test unit locations were selected based on the shovel test results and the presence of exposed features. A summary of test unit results is presented in Table 6.1.

Test Unit 1

Test Unit 1 was placed along the northeast slope of the site and south of the road to investigate a possible midden that had been identified by archeologists during the 1997 cultural resource reevaluation project (Charles et al. 1999b). The unit was oriented to true north and placed a short distance south of the road cut. It was excavated in four stratigraphic layers to a maximum depth between 40 and 55 cm below the surface. The control unit was placed in the northeast corner, and the datum (119.7 m N, 105.6 m E, 1.42 mbsd) was the ground surface of the northwest corner.

The first layer removed was the sod layer (Layer 1). This layer ranged from 1.5 to 4 cm thick. It consisted mostly of matted prairie grasses and their roots. Two flaked-lithic artifacts were recovered from the sod. Beneath the sod layer was a thicker layer of harder, more compacted sediments. This layer, Layer 2, was excavated in two levels, for a total thickness between 0.5 and 15 cm. Because the test unit was placed along the slope, the southeast corner was lower, so no sediments were excavated from this corner for the first level. Flaked-lithic artifacts, bone, and a piece of a wooden stake were recovered from this gravelly level. Layer 2/Level continued for 0.5 to 7 cm before Layer 3 became visible. The sediments in Layer 2/Level 2 were hard, and the gravel content was similar to that of Layer 2/Level 1. Charcoal was noticed near the bottom of the level where sediments were noticeably darker. At the appearance of the charcoal and darker sediments, excavation was discontinued in Layer 2 and a new layer, Layer 3, was designated. Flaked-lithic artifacts and a ^{14}C sample were collected from Layer 2/Level 2. Layer 3 was excavated as a single unit that ranged from 5.5 to 9.5 cm thick. The gray layer continued throughout the unit and differed from the preceding layer by a decrease in the number of gravels. One bone, a flaked-lithic artifacts, a ^{14}C sample, and a large cord-marked sherd were recovered from the layer. The sherd was found toward the upper limits of the layer. A color change and looser sediments defined the difference between Layer 3 and Layer 4. Layer 4 was excavated in three levels, for a total thickness between 24 and 31.5 cm. Artifacts increased in the top of Layer 4/Level 1; sherds, flaked-lithic artifacts, bone and ^{14}C samples were recovered in the level. A flotation sample from the level contained wood charcoal, a burned seed, and burned corn. The corn was submitted for an AMS radiocarbon date, which

Table 6.1. Test unit summaries, 5EP1080, FCMR.

Test Unit No.	Layer	Level	Thickness Range (bgs)	Materials Recovered 1/4"	Control 1/16"
1	1	*	1.5- 4 cm	2 flaked-lithic artifacts	No control sample
1	2	1	0-10 cm	3 flaked-lithic artifacts, 1 bone, 1 wood sample	11 flaked-lithic artifacts, 1 bone, ^{14}C sample
1	2	2	0.5- 7 cm	3 flaked-lithic artifacts, 1 ^{14}C sample	4 flaked-lithic artifacts
1	3	*	5.5 - 9.5 cm	1 sherd, 1 bone, 1 ^{14}C sample	1 flaked-lithic artifact
1	4	1	4.5 - 9.5 cm	2 sherds, 2 bone,1 ^{14}C sample[1]	3 flaked-lithic artifacts, 1 bone, ^{14}C sample
1	4	2	8-14 cm	None	6 flaked-lithic artifacts, 5 bone
1	4	3	9-10 cm	None	None
2	1	*	0-1 cm	1 flaked-lithic artifact, 1 rim sherd	No control sample
2	2	*	0-7 cm	1 flaked-lithic artifact, 1 possible piece of burned earth	None
3	1	*	0.5-3 cm	None	No control sample
3	2	1	10 - 13 cm	3 flaked-lithic artifacts, 4 retouched flakes, 1 utilized flake, 1 bone	None
3	2	2	10 cm	6 flaked-lithic artifacts,1 biface fragment,1 sherd, 3 bone	7 flaked-lithic artifacts, 1 bone, 1 ^{14}C sample
3	2	3	4.5 - 13.5 cm	3 flaked-lithic artifacts, 2 sherds, 2 bone, 1 ^{14}C [1] sample, 1 wood sample	1 flaked-lithic artifact, 4 bone, 1 ^{14}C sample

* Excavated as a single stratigraphic layer

[1]Radiocarbon date obtained.

returned a calibrated 2–sigma radiocarbon age of 765–665 BP (Beta 140326), with a calendar intercept date of AD 1255 (Appendix VII). The ground topography at the base of Layer 4/Level 1 slopes to the northeast, resulting in an undulating boundary between layers. A significant dip in Layer 3 was noticed while excavating in what was assumed to be Layer 4; therefore, we believe that the artifacts and charcoal recovered from Level 1 in Layer 4 are more likely from the base of Layer 3. In Layer 4/Level 2 sediments remained loose and easy to excavate; charcoal decreased but was still present along with a few artifacts. Sediments in Layer 4/Level 3 continued to be easy to excavate, charcoal decreased further, and artifacts were not recovered in the unit. After one culturally sterile level, excavations were terminated in this unit.

The west (east–facing) and north (south–facing) profile walls are illustrated in Figure 6.4. Four major stratigraphic units were defined, and these are described below.

Stratum I — Stratum I is a brown (10YR 5/3) sandy loam A soil horizon. Sediment size is very fine sand to silt; some of the silt is probably eolian in origin. The soil structure is weak blocky to single grain. The lower boundary is smooth and abrupt. There is a light to moderate reaction to hydrochloric acid. Gravels (<2%), roots, and artifacts occur in this thin sod layer.

Stratum II — Stratum II is a hard compacted silt loam with gravel. It is discontinuous across the layer and probably represents colluvium with artifacts overlying an *in situ* cultural stratum. It is brown to dark-brown (10YR 4/3), with coarse sand to gravel-size igneous and metamorphic rock. The sediments are angular blocky; and the peds are moderately developed in this B soil horizon. The lower boundary is clear and discontinuous. There is a light to moderate reaction to hydrochloric acid. Gravels account for about 5% of the matrix. Charcoal, artifacts, roots, and worm holes are present.

Stratum III — Stratum III is a B soil horizon formed in a cultural layer. It is charcoal-enriched, which gives it a grayish brown (10YR 5/2) color. Artifacts include sherds, bone, and flakes. Sediments are a silt loam with coarse sand and about 15% gravels. The gravels are angular to subrounded. The peds are angular blocky, and moderately developed. The lower boundary is clear to abrupt and wavy. There is a moderate to violent reaction with hydrochloric acid. Roots, and worm casts are present.

Stratum IIIa — Stratum IIIa appeared in the west (east–facing) profile wall. When wet, it is a very dark, grayish brown (2.5YR 3/2), sandy silt loam. The soil structure is angular blocky with moderate ped development. The lower

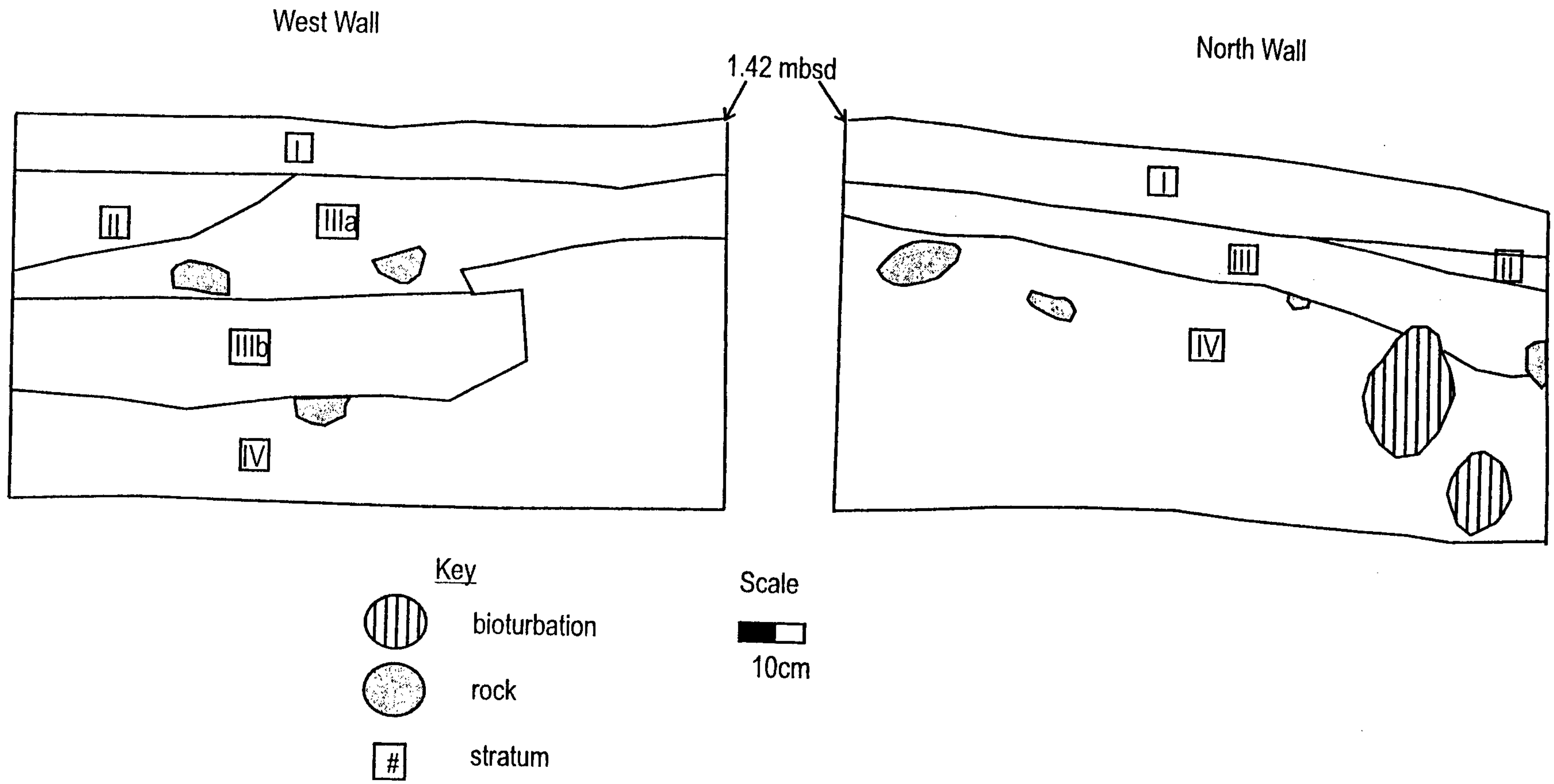


Figure 6.4. West-wall profile and north-wall profile, Test Unit 1, 5EP1080, FCMR.

boundary is clear and wavy. About 5% of the sediments are angular to subrounded gravels. Sediments reacted violently to hydrochloric acid. Artifacts are present in this bioturbated stratum. The lower boundary is clear and wavy.

Stratum IIIb Stratum IIIb appeared in the west (east–facing) profile wall as well. The differences between Stratum IIIa and IIIb is the decrease in gravel to about 2% and the increase in artifacts in Stratum IIIb. It is noted, however, that these differences may result from bioturbation, and therefore this distinction may not be significant. The lower boundary between Stratum IIIb and Stratum IV is abrupt and wavy.

Stratum IV Stratum IV is a Bk to C soil horizon. It is a grayish brown (10YR 5/3) coarse sand with gravel (25%), and some fine sand. The soil structure is granular. The lower boundary remains concealed. The sediments reacted violently to hydrochloric acid. Roots are present, and light charcoal flecks occur in areas of bioturbation. Artifacts were found near the interface between Strata III and IV. Stratum IV comprises colluvial and alluvial gravels with mostly coarse sand, small pebbles, and a few larger pebbles and cobbles. This stratum underlies and therefore predates the cultural occupation of Stratum III.

Test Unit 2

Test Unit 2 was placed in the road and over a stain previously identified as a possible cultural feature (Charles et al. 1999b). The test unit was placed such that the stain, which was visible at the surface, was near the center of the unit. The control sample was taken from the southeast corner. The southeast corner also served as the datum (125.0 mN, 102.2 mE, 1.70 mbsd). The unit was oriented to true north and excavated in two layers.

Layer 1 consisted of a trowel skim of the loose sediments from the surface to expose the stain in plan view. A flake and a rim sherd were recovered from the scrapings. Layer 2 was designated as the more consolidated sediments beneath the loose sediments of Layer 1. Layer 2 was excavated in a single layer that ranged from 0 to 7 cm thick. It consisted of a light-colored sandy loam that has experienced a degree of compaction from vehicular traffic. Sediments exhibited a platy structure and directly overlay a gravelly lens. Along with the larger stain identified as Feature 1, two smaller stains (Features 2 and 3) were also excavated. A piece of chert shatter and a possible piece of burned earth were the only materials collected from this layer.

The east (west–facing) profile wall is illustrated and described for this test unit

(Figure 6.5). The other walls were too shallow to reveal any stratigraphy. Three strata were identified in the east-wall profile, and they are described below.

Stratum I	Stratum I is a thin layer (3 - 7 cm) of silty loam with sand. It is a light olive gray (5YR 6/2) with a platy soil structure. The lower boundary is abrupt and smooth. The sediments react moderately to hydrochloric acid. Angular and subrounded gravels comprise about 2% of the matrix. These gravels are predominately igneous and metamorphic, and their presence at the site indicates alluvial and colluvial processes at work. A few artifacts occur in this bioturbated stratum.
Stratum II	Stratum II is (1 - 7 cm) thick layer of a pale-brown (10YR 6/3) silt loam with sand. There is a higher sand content than in Stratum I. The soil structure is angular blocky. The lower boundary remains concealed. The stratum reacted moderately to violently to hydrochloric acid. Angular and subrounded gravels, which make up about 2% of the matrix, are predominately igneous and metamorphic. Artifacts encountered in the stratum could have originated in Stratum I. The stratum is bioturbated.
Stratum III	Stratum III (0 - 5 cm) is present only in the southeast corner. It is a grayish brown (10YR 5/2) silt loam with a platy soil structure. The lower boundary is abrupt and smooth. Sediments display a moderate reaction to hydrochloric acid. Bioturbation is present in the layer along with faint charcoal flecks. Gravels, predominately igneous and metamorphic, account for about 2% of the matrix.

Three shallow features were identified and subsequently excavated in this unit (Figure 6. 5).

Feature 1 is a roughly circular area (25-x-25 cm) of very dark grayish brown (10YR 3/2), heavily bioturbated sediments. The maximum depth of the feature is 7 cm. The entire fill was collected for flotation. The flotation sample produced snail shells, seeds, three flaked-lithic artifacts, two pieces of bone, and some charcoal. The charcoal sample was very small and probably contaminated, and was therefore not sent for ^{14}C dating.

Feature 2 is a small circular area of very dark grayish brown (10YR 3/2)

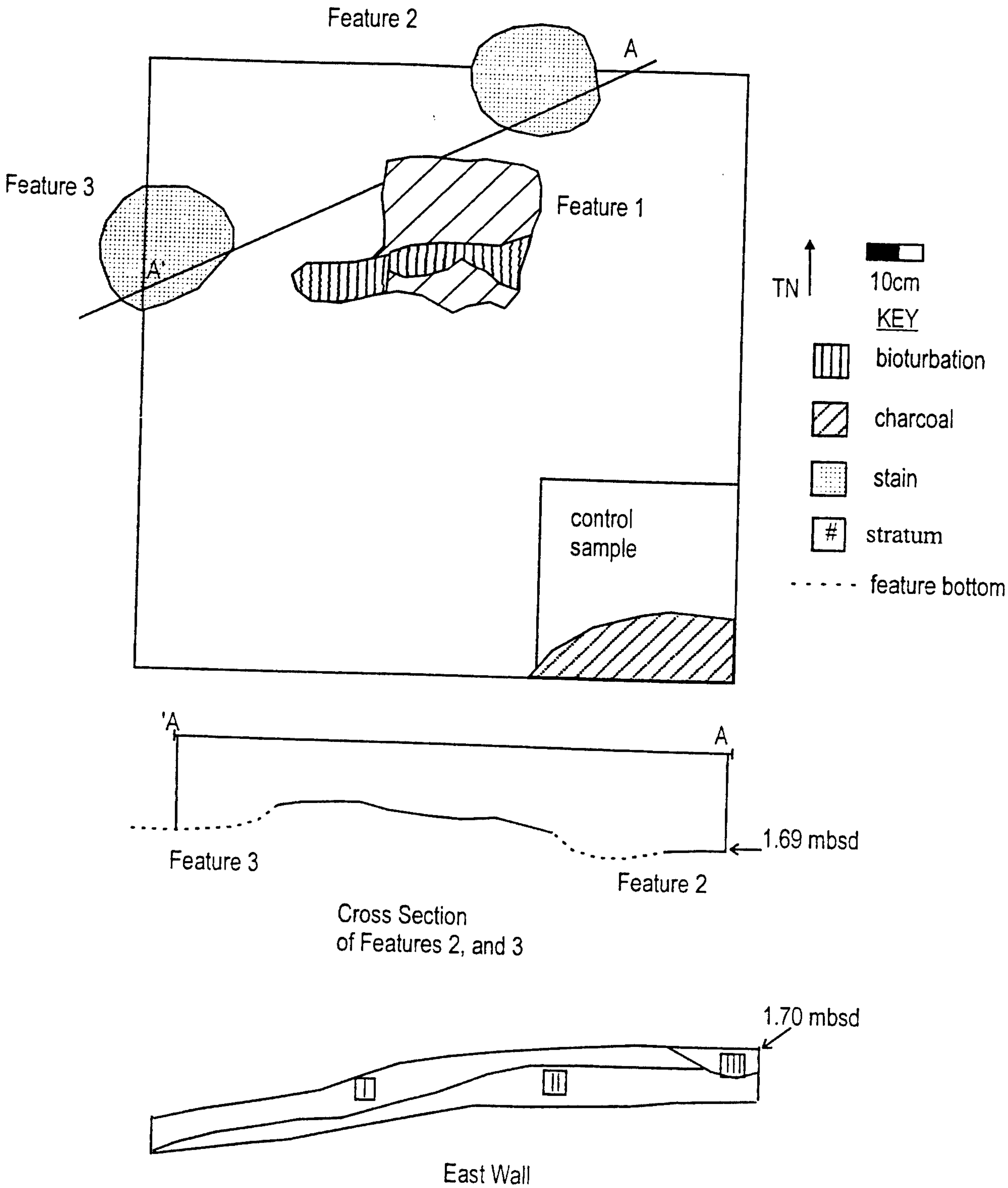


Figure 6.5. Planview and profile, Features 1, 2, and 3, and Test Unit 2, 5EP1080, FCMR.

sediments. The entire fill was taken as a flotation sample. The feature measured 22- x-20 cm and was less than 5 cm deep. The fill was heavily bioturbated. The flotation sample recovered one flaked-lithic artifact and some charcoal. The charcoal sample was very small and probably contaminated, and was therefore not sent for ^{14}C dating.

Feature 3 is a small circular area of very dark grayish brown (10YR 3/2) sediments. The feature measured 22-x-19 cm and was less than 5 cm deep. The fill, which was collected for flotation, was heavily bioturbated with numerous charcoal inclusions. Three flaked-lithic artifacts, four pieces of bone, and some charcoal were recovered from the flotation sample. The charcoal sample was very small and probably contaminated, and was therefore not sent for ^{14}C dating.

The features are small and shallow, and their origin and function remain inconclusive. The two smaller features resemble post holes; however, due to the shallow extent of the fill and the disturbance as a result of the roadcut, it is presumptive to decide on their function. The larger feature shows no oxidation but it is also heavily bioturbated, which greatly limits its information potential. The conclusions that can be drawn from these amorphous features are extremely limited; however, Features 2 and 3 particularly are interpreted as prehistoric features.

Test Unit 3

The final test unit was placed along the top of the ridge closer to the south-central portion of the site and in an area where shovel testing had revealed a good potential for buried cultural deposits. Additionally, Shovel Test 10 had exposed a piece of rotting wood that appeared to be from a limb as opposed to a root. The test unit was placed adjacent to this shovel test to expose and more closely examine the wood. The control unit was placed in the southeast corner as was the vertical datum (80.8 mN, 93.0 mE, 0.90 masd).

The unit was excavated in two layers to a final depth between 29.5 and 36.5 cm below the ground surface. Layer 1, the sod layer, was about 3 cm thick and contained no artifacts. Layer 2 consisted of a thick stratum of brown silty loam with gravels, artifacts, charcoal, and an occasional cobble. This layer was excavated in three levels, for a total thickness of 27.5 to 33.5 cm. Charcoal began at the bottom of Level 1, Layer 2. Flaked-stone artifacts and bone were recovered from this level. In Layer 2/Level 2, charcoal increased and was recovered throughout the level. Artifacts included flaked-lithic artifacts, bone, a sherd, and charcoal. The sediments were more mottled than the overlying level. Gravels decreased, while the larger rocks increased. Layer 3/Level 3 was excavated to culturally sterile deposits. Flaked-lithic artifacts, sherds,

bone, a piece of partially burned wood, and a ^{14}C sample were recovered from Layer 2/Level 3. This ^{14}C sample was submitted for standard radiocarbon dating. The sample of charred materials produced a calibrated 2-sigma radiocarbon date of 1080–695 BP. (Beta 140327), with a calendar intercept date AD 1025 (Appendix VII). The silty loam sediments were followed until contact with the culturally sterile sand layer, which resulted in an uneven bottom. The partially burned wood is part of the same piece of wood exposed in Shovel Test 10, but it is uncertain if this wood is cultural, although this possibility is not dismissed.

Three strata were identified in this unit, and they are described in detail below. The south (north–facing) and the east (west–facing) wall profiles are illustrated in Figure 6.6.

Stratum I — Stratum I is a thin layer (3 - 5 cm) of dark-brown (10YR 4/3), loose silty loam. It is the sod or A soil horizon. The soil structure is granular to platy. The lower boundary is gradual and smooth. There is a slight reaction to hydrochloric acid. Bioturbation from the surface ground cover is extensive.

Stratum II — Stratum II is a thick layer (30 cm) of dark yellowish brown to dark-brown (10YR 4/4 to 4/3) silt loam. This stratum represents a weak B soil horizon. The peds are weak, angular blocky. The lower boundary is abrupt and wavy. Gravels comprise about 20% of the matrix. These gravels are mostly quartzite, feldspar, granite, and shale mixed with some coarse-grained sand. Roots and other forms of bioturbation increase toward the bottom of the layer. Sediments from the layer react violently to hydrochloric acid. Artifacts are common in this stratum, consisting of flakes, sherds, charcoal, and bone.

Stratum III — Stratum III is a yellowish brown (10YR 5/4) fine sand. The structure of the soil is single grain, and it is the C soil horizon. The lower boundary remains concealed. Gravels or inclusions other than bioturbation were not noted in the top of the layer. The sediments react moderately to hydrochloric acid. This sand layer is culturally sterile.

Material Culture

A total of 265 artifacts was analyzed. The surface assemblage includes one hundred and thirty-one pieces of debitage, four scrapers, four unpatterned flake tools, three manos, two bifaces, one projectile point, and ten sherds. The surface debitage was analyzed in the field and left. The flaked-lithic tools, sherds, and the manos were collected. One hundred and ten artifacts were recovered from subsurface explorations.

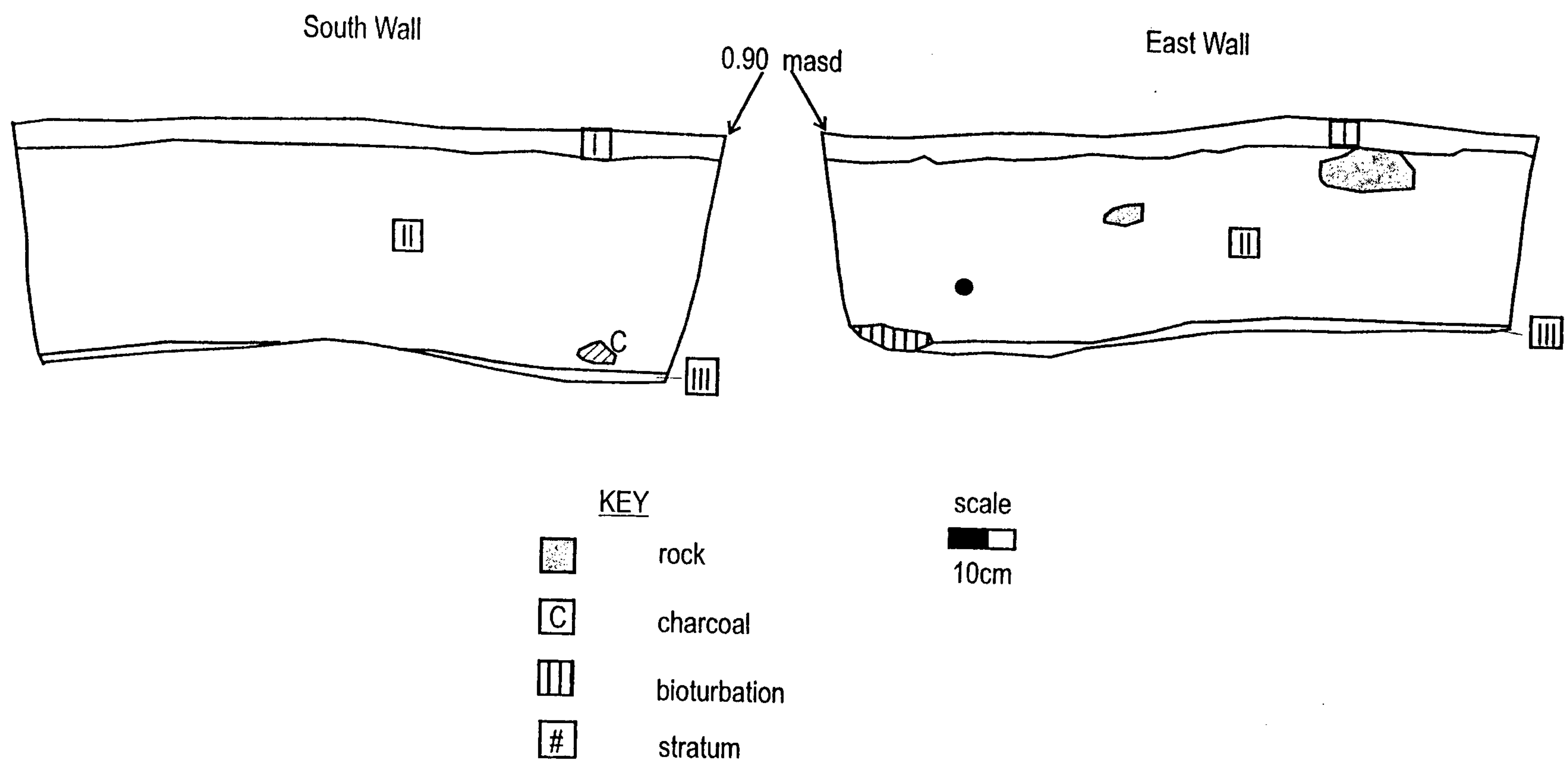


Figure 6.6. South-wall profile and east-wall profile, Test Unit 3, 5EP1080, FCMR.

These include eighty-one pieces of debitage, ten unpatterned flake tools, three bifaces, and sixteen sherds. A third of the subsurface artifacts were found during shovel testing, and the remainder were recovered from the three test units. Quantitative information on the lithic tools, cores, and manos is presented in Appendices III and IV.

Flaked-Lithic artifacts

One small, expanding stemmed projectile point (5EP1080.85b) was collected (Figure 6.7a). The point is manufactured from a light-brown silicified wood with heavy patination on one side. This specimen is missing some key attributes: one shoulder, the tip of the other shoulder, and, most importantly, the bottom of the base. Remaining attributes include a sharp tip, a triangular blade with slightly convex blade edges, a narrow expanding stem, and a bi-convex cross-section. This projectile point is consistent with previously collected artifacts from the FCMR in terms of size and blade shape, but the lack of a base makes comparisons to other projectile points impractical.

Two projectile points and one unidentifiable fragment were previously documented at the site (Jepson et al. 1992:145). Although the original site form states that four projectile points were noted, only two are discussed in the ensuing report. Presumably all four were collected. One projectile point is described as a Type 15 (Jepson et al. 1992:145), which is a small flange-stemmed projectile point with a suggested date of AD 750 to AD 1650. The other projectile point is a fragment. One small flange-stemmed projectile point (5PE1080.84b) was collected during reevaluation of the site by FLC in 1997 (Charles et al. 1999b:Appendix II.5). It was suggested that this specimen compares favorably with Category P83 projectile points from the PCMS. This projectile point also compares favorably with points collected from other sites at the FCMR such as the Avery Ranch site (5PE56) and the Ocean Vista site (5PE868).

Five bifaces were collected from the site during testing, two from the surface and three from the subsurface. Three are complete and the other two are fragmentary. Both finished and unfinished bifaces are present. Two of the complete bifaces represent large, unfinished, patterned bifaces in the early to middle stages of reduction. One of these complete bifaces (5EP1080.85g) is made from a yellow-and-brown banded silicified wood (Figure 6.7b). This specimen is a good example of the lenticular-shaped bifaces previously documented at the FCMR (Charles et al 2000:7.4). The artifact is still in the initial stage of reduction. However, the presence of bimarginal use wear on the blade edges suggest that it was used; therefore, it may never have been intended for further reduction. One side is thinned more extensively with little emphasis on the

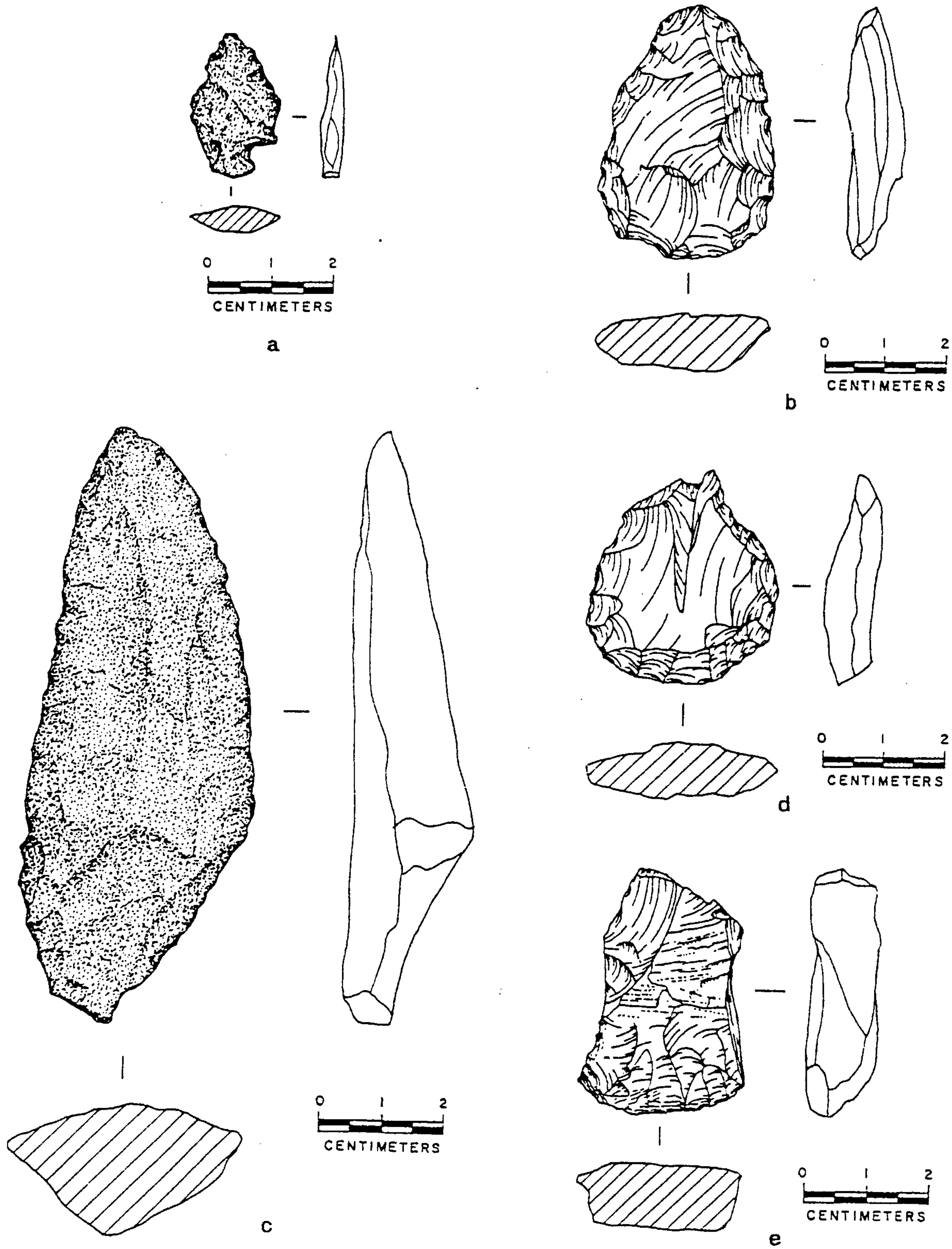


Figure 6.7. Illustrated artifacts from 5EP1080, FCMR: a) projectile point 5EP1080.85b; b) biface 5EP1080.85g; c) large biface 5EP1080.113e; d) scraper 5EP1080.85r; e) scraper 5EP1080.85d.

other side, which possesses cortex. The other complete unfinished biface (Figure 6.7c) is made from gray orthoquartzite (5EP1080.113e). It is a thick patterned biface that is triangular in cross-section. Most likely it was used as a knife. Bimarginal retouching is present along three-quarters of the modified edge, and there is evidence of use wear. The distal end possesses the most complete thinning. The third complete biface is a small, thin, lenticular-shaped patterned biface made from yellow-brown chert. The proximal end displays the remains of a bulb of percussion. One edge has bimarginal use wear near the tip. The two biface fragments are considered to be small, thin, patterned bifaces. One specimen is a biface tip made from brown dendritic chert. The other is a nearly complete biface missing only the tip. It is made from gray orthoquartzite. The proximal end is straight, and the blade edges taper slightly, creating a narrow elongated shape. One side of the blade demonstrates more extensive thinning than the other. Neither biface fragment exhibits evidence of utilization.

All four scrapers were found on the surface. Two scrapers are complete and two are broken. One of the complete scrapers (Figure 6.7d) is manufactured from a light brown chalcedony flake (5EP1080.85r). This specimen has patterned unifacial flaking along the thickest edge, and there is evidence of unifacial use wear along the beveled edge. This scraper has bifacial retouch flaking and use wear along the lateral margins. The other complete scraper, which is also beveled, is made from a white chert flake. A broad protrusion on one end of the flake has patterned unifacial flaking. Unifacial use wear is evident along one side of the protrusion. One of the broken scrapers (Figure 6.7e) is manufactured from a yellowish-brown silicified wood flake (5EP1080.85d). This specimen has patterned unifacial flaking along the thickest edge of the artifact. The thickness of the flake was beneficial in the creation of a beveled edge. Bimarginal retouching is apparent along the modified edge. This edge extends to the break, suggesting that this tool broke during use. There is evidence of unifacial use wear along the beveled edge. The other broken scraper is made from a light-brown chalcedony flake. Patterned unifacial flaking is present along the rounded portion of the flake. One side of the modified edge extends to the break, suggesting that this artifact broke during use. A slight amount of unifacial use wear is present.

Fourteen unpatterned flake tools were identified, four from the surface and ten from the subsurface. Of the ten found subsurface, five were found in Test Unit 3, and five were found in shovel tests. Half of the flake tools are broken. Ten of the tools are classified as retouched flakes and four are classified as utilized flakes. Three of the retouched flakes have both bimarginal retouching and bimarginal use wear. Four retouched flakes have unimarginal retouching and unimarginal use wear. Two retouched flakes have unimarginal retouching and no evidence of utilization. One retouched flake has unimarginal retouching and bimarginal use wear. Two of the

utilized flakes have bimarginal use wear and the other two have only unimarginal use. The majority (11) of these tools are made from cherts of various colors. These tools are small in size, with none larger than 1" and five are smaller than ½". The modified tool edges on the broken flakes extend to the break. This suggests that these tools broke during use or manufacture.

Two hundred and twelve flakes make up the non-tool flaked-artifact assemblage. All observed surface flakes were analyzed in the field. The information from this analysis was incorporated with the data accumulated from the analysis of the subsurface artifacts. These data are presented in Table 6.2. Limited excavation at the site accounts for 38% of the total assemblage, which is relatively high since less than 1% of the site was tested. Locally obtained raw material types dominate the sample, with chert being the most prevalent (54%). Orthoquartzite, silicified wood, and chert account for 89% of the flake assemblage. The percentage of silicified wood (16%) is the highest at any site investigated during this testing project. Simple and complex flakes occur in nearly equal percentages. Small amounts of shatter and bifacial thinning flakes are also present. The majority of flakes do not possess cortex. Small (<½") flakes account for just over half of all flakes. Another quarter of the flakes are large (>1").

The prevalence of generally smaller flakes and the noticeable number of complex flakes imply that late-stage lithic-reduction activities, including tool manufacture, took place at the site. The presence of a high number of large flakes and flakes with cortex indicates that earlier-stage reduction activities occurred, but were less common. The debitage assemblage was categorized using the Sullivan and Rozen (1985) classificatory system. Interpretations of the data indicate that tool manufacture was the primary activity at the site. This interpretation is based on the high number of flake fragments combined with the high number of broken flakes. The relatively high number of complete flakes and the relatively large amount of flaking debris imply that activities such as core reduction also took place.

Comparisons between the subsurface and the surface flakes indicate several differences. No large flakes and a higher percentage of the smaller flakes are present in the subsurface remains. The high number of small flakes from the subsurface is understandable since small flakes are more difficult to identify on the surface. Thirty of the 62 flakes collected from test unit excavation are smaller than ¼". Thirty-nine flakes were recovered from the test unit control samples; 30 are smaller than ¼" and would have fallen through the conventional mesh. The ratio of simple to complex flakes is reversed between the surface and subsurface, with simple flakes occurring at a higher rate in the subsurface than complex flakes. The percentage of artifacts without

Table 6.2. Surface and subsurface non-tool flaked-lithic debitage, 5EP1080, FCMR.

Material Type	Quartzite/Orthoquartzite S	Quartzite/Orthoquartzite SS	Quartzite/Orthoquartzite Subtotal	Quartzite/Orthoquartzite %	Chert S	Chert SS	Chert Subtotal	Chert %	Chalcedony S	Chalcedony SS	Chalcedony Subtotal	Chalcedony %	Silicified Wood S	Silicified Wood SS	Silicified Wood Subtotal	Silicified Wood %
Size Grade																
>1"	15	0	**15**		23	0	**23**		1	0	**1**		8	0	**8**	
1/2" - 1"	6	3	**9**		10	8	**18**		0	3	**3**		3	1	**4**	
<1/2"	11	5	**16**		29	45	**74**		3	6	**9**		16	6	**22**	
Total	**32**	**8**	**40**	*18.9*	**62**	**53**	**115**	*54.2*	**4**	**9**	**13**	*6.1*	**27**	**7**	**34**	*16*
Flake Type (Ahler 1997)																
Shatter	7	0	**7**		9	5	**14**		1	0	**1**		5	1	**6**	
Simple	10	7	**17**		15	34	**49**		0	7	**7**		5	2	**7**	
Complex	15	1	**16**		37	13	**50**		3	1	**4**		17	2	**19**	
Bifacial Thinning	0	0	**0**		1	1	**0**		0	1	**1**		0	2	**2**	
Total	**32**	**8**	**40**	*18.9*	**62**	**53**	**115**	*54.2*	**4**	**9**	**13**	*6.1*	**27**	**7**	**34**	*16*
Cortex																
Present	13	1	**14**		16	5	**21**		2	1	**3**		12	0	**12**	
Absent	19	7	**26**		46	48	**94**		2	8	**10**		15	7	**22**	
Total	**32**	**8**	**40**	*18.9*	**62**	**53**	**115**	*54.2*	**4**	**9**	**13**	*6.1*	**27**	**7**	**34**	*16*
Flake Type (Sullivan and Rozen 1985)																
Complete	11	2	**13**		19	7	**26**		1	4	**5**		7	1	**2**	
Broken	8	3	**11**		19	13	**32**		1	2	**3**		10	1	**11**	
Flake Fragment	6	3	**9**		15	28	**43**		1	3	**4**		5	4	**9**	
Debris	7	0	**7**		9	5	**14**		1	0	**1**		5	1	**6**	
Total	**32**	**8**	**40**	*18.9*	**62**	**53**	**115**	*54.2*	**4**	**9**	**13**	*6.1*	**27**	**7**	**34**	*16*

S Surface
SS Subsurface

Table 6.2. Surface and subsurface non-tool flaked-lithic debitage, 5EP1080, FCMR (cont).

Material	Quartz				Siltstone				Total	
Type	S	SS	Subtotal	%	S	SS	Subtotal	%	No.	%
Size Grade										
>1"	0	0	**0**		5	0	**5**		**52**	*24.5*
1/2" - 1"	1	1	**2**		0	0	**0**		**36**	*17*
<1/2"	0	3	**3**		0	0	**0**		**124**	*58.5*
Total	**1**	**4**	**5**	*2.4*	**5**	**0**	**5**	*2.4*	**212**	*100*
Flake Type (Ahler 1997)										
Shatter	1	1	**2**		1	0	**1**		**31**	*14.6*
Simple	0	3	**3**		1	0	**1**		**84**	*39.6*
Complex	0	0	**0**		3	0	**3**		**92**	*43.4*
Bifacial Thinning	0	0	**0**		0	0	**0**		**5**	*2.4*
Total	**1**	**4**	**5**	*2.4*	**5**	**0**	**5**	*2.4*	**212**	*100*
Cortex										
Present	1	0	**1**		3	0	**3**		**54**	*25.5*
Absent	0	4	**4**		2	0	**2**		**158**	*74.5*
Total	**1**	**4**	**5**	*2.4*	**5**	**0**	**5**	*2.4*	**212**	*100*
Flake Type (Sullivan and Rozen 1985)										
Complete	0	2	**2**		3	0	**3**		**57**	*26.9*
Broken	0	0	**0**		1	0	**1**		**58**	*27.4*
Flake Fragment	0	1	**1**		0	0	**0**		**66**	*31.1*
Debris	1	1	**2**		1	0	**1**		**31**	*14.6*
Total	**1**	**4**	**5**	*2.4*	**5**	**0**	**5**	*2.4*	**212**	*100*

S Surface.
SS Subsurface

cortex is higher in the subsurface. The percentages of chert and chalcedony artifacts are lower on the surface, while silicified wood and orthoquartzite are less frequent from the subsurface.

Groundstone

Three sandstone manos were collected from site 5EP1080. Two are complete and one is broken. Quantitative data for the groundstone are found in Appendix IV. One mano is a two-sided mano. The material type is a medium-grained sandstone. One use surface is texturally smooth and the use-wear pattern indicates a reciprocal rocking motion. The other use surface seems to have been used in a circular rocking motion, as well as for crushing. Charcoal is present on this use surface. The second mano is a medium-grained sandstone mano pecked and ground into its present shape. Battering is present along the edges. Both use surfaces indicate a reciprocal rocking (back and forth) motion. The third mano is a broken fine- to medium-grained sandstone mano with use surfaces on two opposite faces. One surface has an abundance of caliche between the sand grains. Edge grinding and battering on one end imply crushing actions. The crushing action occurred after its initial use as a grinding implement. This suggests that the function of the artifact changed during its use life. The use wear on this mano is hard to assess because of its broken state. The two use surfaces have recent damage to them, making microscopic observations nearly impossible.

Ceramics

Over the three seasons of inventory and testing conducted at this site, 33 sherds were collected and analyzed. The results are presented in Appendix I of this report. Twenty-six of these were collected during the 1999 field season. Ten sherds were collected from the surface, nine from shovel tests, and seven from the test units. Some of these sherds are fragments of a single larger sherd. One rim sherd was recovered from the subsurface. Examples of both coiled (75%) and mass modeled(25%) techniques are present in this assemblage. According to Krause (Appendix I this volume), mass modeling predates coiling. The radiocarbon dates from the site place occupation sometime between the 9th and 13th centuries AD An AMS date on burned corn reflects site occupation from the 12th - 13th centuries AD

Faunal

A total of 38 individual faunal remains were recovered from the three test units and the shovel tests (Appendix V). None of the pieces had been worked or otherwise

used. The pieces were very fragmented, making identification difficult. *Odocoileus, Canis*, and *Rodentia* were represented, as were other unidentifiable small mammals. The small sample size limits the amount of inferences that can be made. Only three pieces were identifiable to the genus level. Two of these belonged to *Odocoileus*. However, assuming that some at least of the small- and medium-sized mammal pieces are also from this animal, it can at least be hypothesized that the long bones were broken for marrow extraction and further bone rendering. One *Canis* metatarsal was not identifiable to the species level; therefore, it is unclear as to whether it is coyote, wolf, or domesticated dog. Of the 22 identifiable bones, 20 are mammal and 2 are rodents. It is hypothesized that many of the remains of small mammals and rodents were a result of natural processes rather than the result of cultural activity on the part of the site's inhabitants. Five pieces of bone were burned. There are three small mammal bones represented; two of the these are long-bone shaft fragments, and the other is unidentifiable as to element. One medium-sized mammal long-bone shaft is represented, and the fifth burned bone is unidentifiable as to species. All of these burned bone are from buried contexts and were found in identified ethnostratigraphic units. As with all archeological sites, there is a possibility that burning occurred as a result of post-depositional fires, rather than cultural activity. Their presence in a midden supports their cultural association. It is interesting that on this open site, this small sample of faunal remains consists mostly of mammal bones, which contrasts with assemblages from the shelter sites where rodent bones account for a much higher percentage of the total. Perhaps the assemblage from this open site better reflects the actual prehistoric use of animals because the sampling error from rodent activities such as from packrats is filtered out.

Macrobotancial

Three macrobotanical samples were submitted for analysis. These samples were collected from each of three small features. The results of macrobotanical analysis are presented in Appendix VI.

Summary and Conclusions

Surface artifacts are generally present as a dispersed scatter of flakes, flaked-lithic tools, sherds, and bone. There are no significant concentrations of artifacts; however, artifact clusters occur in areas of erosion (blow-outs) near the south end of the site and within and adjacent to the road that bisects the site. Subsurface testing at the site indicates that cultural deposits are present. Sixteen of thirty-eight (42%) shovel tests produced subsurface artifacts. Nineteen flakes, two bifaces, five unpatterned flake tools, and nine sherds were recovered during subsurface testing. Shovel Test 11 had artifacts

as deep as 65 cm below the surface, but the remainder of the shovel tests that produced artifacts did so between 0 and 30 cm below the surface. Two shovel tests had only charcoal from 30 to 50 cm below the surface. Artifact distribution, as demonstrated in the shovel tests, intimates a possible lateral distribution of subsurface deposits, which may or may not represent temporally discrete loci, although a short hiatus between occupations is hinted at in the separation of stratigraphic layers, albeit within a single major cultural/temporal period. Shovel testing showed that subsurface artifacts are concentrated in two areas of the site. The first area of concentration is along the ridge top and on both sides of the ridge slopes near the southern edge of the site, while the second area is adjacent to the road along the ridge top and along the east slope of the ridge. No shovel tests were conducted along the east slope between these two concentrations, and it remains a very viable option that subsurface cultural deposits are thickest along the east slope of the ridge and into the swell at the position where the ridge slope begins to slightly flatten.

Test unit excavations provide evidence of a buried, although slightly compromised, cultural component. Excavations in Test Unit 1 provided evidence of a buried cultural deposit. Artifacts range in depth from 30 to 46 cm below the surface. Test Unit 1 produced artifacts including flakes, tools, sherds, and a ^{14}C sample that dates between 766 and 665 BP or within the Diversification period of the Late Prehistoric stage. These cultural deposits are confined mostly to Stratum III, a buried B soil horizon. This stratum is further subdivided into IIIa and IIIb where it was most notable in the west-wall profile. Distinctions may be more a result of moisture and bioturbation than of cultural behavior, but there is a clearly buried cultural layer (ethnostratigraphic unit) identified in Test Unit 1. Bioturbation has undoubtedly affected the distribution of material, but not to the extent that it has seriously compromised the integrity of the buried cultural stratum. Cultural material was recovered to Stratum IV. Thirty-three flakes and three sherds were recovered from this unit.

Test Unit 2 was placed over the stain in the road bed. The remnants of three features were exposed after scraping loose dirt from the surface. Very little remained of the features. Although the conclusions that can be drawn from these amorphous features are extremely limited, we interpret them, particularly Features 2 and 3, as a result of the prehistoric human occupation at the site. A total of nine flakes and one sherd was derived from the excavation of Test Unit 2, which includes the features.

Results from the excavation of Test Unit 3 demonstrate the presence of a buried cultural layer (ethnostratigraphic unit). Artifacts were found primarily in Stratum II, which ranged in depth from 29 to 35 cm below the ground surface. A total of twenty

flakes, six flaked-lithic tools, and three sherds were recovered from unit excavation. A ^{14}C date from charred material produced a date of 1080–695 BP, which overlaps slightly with the ^{14}C date from Test Unit 1.

The number of artifacts at this site suggests that the site was occupied for either an extended period of time or was repeatedly visited. Locally procured raw materials were exploited. There is diversity in the assemblage even though unmodified flakes are the most abundant. Tools recovered include projectile points, bifaces, scrapers, unpatterned flake tools, and groundstone. Characteristics of the flake assemblage suggest a preference towards later stages of reduction and tool manufacturing; however, some earlier stages of core reduction are also inferred.

Previously collected projectile points from this site resemble projectile points from other documented sites at the FCMR, which date between AD 750 and AD 1650. One projectile point was collected from the testing phase, but its fragmentary state precludes assigning it to a specific temporal range.

A relatively high number (33) of sherds has been collected from the site. These have been collected from the surface as well as from testing. Both mass modeled and coiled manufacturing techniques are present in the assemblage. According to Krause (Appendix I), the technique of mass modeling was introduced to the Fort Carson area by groups from the north and east, and coiling was introduced at a later date by groups from the south and west. The majority of sherds display coiling; therefore, it is suggested either that the site was occupied by two noncontemporary groups—each practicing a single manufacturing technique—or that its occupants practiced both techniques, but at a time when coiling was beginning to replace mass modeling as the primary manufacturing technique.

Meander scars are present below the site along the terrace of Little Fountain Creek, and they were formed from the lateral migration of the creek. Cut banks created by headward erosion run perpendicular to the present stream course. Sedimentary facies change from weathered gravels on the ridge top to sand and colluvium along the slopes. Further downslope these sediment are replaced by alluvium. The burial is in alluvium, and may have been buried on a relict terrace of Little Fountain Creek. Human interment at the edge of terraces is a practice not uncommon to prehistoric Plains Indians (Butler et al. 1986).

The results from site testing and evaluation are used to recommend that the site be considered eligible for nomination to the NRHP under Criterion D. It is recommended that if future testing or excavation is required at this site it be conducted

along the ridge top and along the east slope of the ridge where subsurface testing has identified the best potential for undisturbed buried cultural deposits. Further, more substantive excavations may afford the possibility of acquiring additional radiometric dates, which could better explain the sequence of site occupation and provide data useful for expanding the current knowledge base on the ceramic-bearing occupants of the FCMR. The site is recommended as eligible for nomination to the NRHP under Criterion D of 36CFR60; the potential to yield significant archaeological data. The site has been determined to contain significant *in situ* buried deposits and has the potential to yield information on the research themes of chronology and cultural relationships, settlement patterns, the nature of prehistoric economies, horticulture, paleoclimates, and technology and material culture as defined in the CRMP (Zier et al. 1997).

CHAPTER 7
5EP1345

Introduction

This small (706 m^2) prehistoric sheltered site was originally recorded in 1990 by CA (Jepson et al. 1992:275). It was described as a rock shelter in the uppermost stratum of Dakota Sandstone, east and above Little Turkey Creek. A small quantity of artifacts including groundstone, flaked-lithic debitage, and flaked tools was present in the shelter and scattered along the slope in front of the shelter. With the exception of groundstone, all visible surface artifacts were collected during the original 1990 recording. A Middle Archaic Hanna-type projectile point was collected from the site (Jepson et al. 1992:141). Charcoal was noted in the shelter interior, suggesting possible buried cultural deposits. The site was recommended as eligible for nomination to the NRHP because of the presence of a Middle Archaic projectile point, a rare occurrence in the FCMR, and because of the potential for intact subsurface cultural material (Jepson et al. 1992:141).

The site was revisited in 1997 by FLC (Charles et al. 1999b:6.22) during a cultural resources reevaluation project. Although all visible surface artifacts had been collected in 1990, the surface was reinventoried because more artifacts were noted on the surface. One metate fragment, a biface tip, a biface, a sherd, and fifty-six flakes were identified. A trowel test in the shelter recovered the base of an Eden projectile point and a single flake between 0 and 5 cm below the present surface (Charles et al. 1999b:6.22). The trowel test was not continued beyond this depth because it was concluded that site significance had been established at this point. An exfoliated sherd was collected in 1997 as well (Charles et al. 1999b:6.22). The diagnostic artifacts collected from the two recording sessions suggested that the site may be multiple-component, with occupation perhaps occurring during the Late Paleo Indian, the Middle Archaic, and the Developmental to Diversification periods. The site was recommended as eligible for nomination to the NRHP based on the research themes of culture and chronology, paleoclimates, prehistoric economies, and settlement patterns as identified by Zier et al. (1997). Management recommendations included avoidance and protection, and evaluative testing (Charles et al. 1999b:6.22).

The site, at an elevation of 6,480 ft (1,975 m) asl, comprises a rock shelter and a midden-like deposit that covers the slope in front of the shelter (Figure 7.1). The site is below an exposed bedrock escarpment and about one-third of the way up a north–

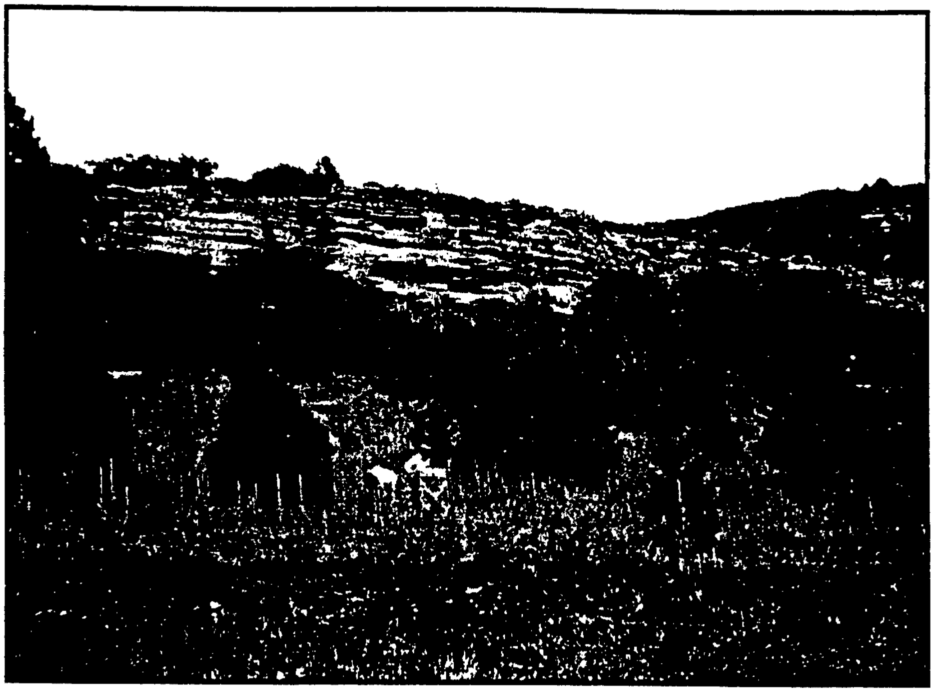
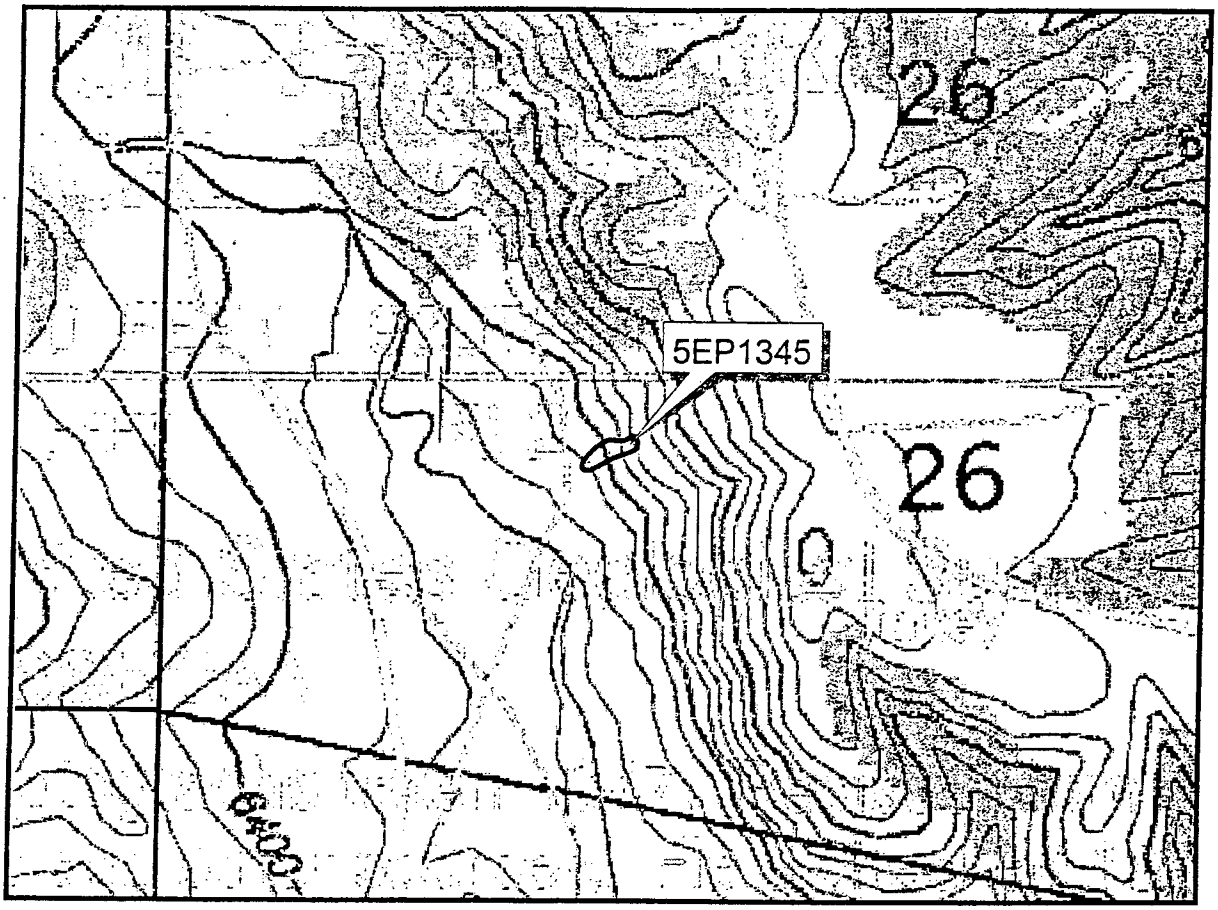


Figure 7.1. Overview of the rock shelter, 5EP1345, FCMR. View is to the east.

south trending ridge. This ridge separates the Little Turkey Creek and Turkey Creek drainages. It is located on the Timber Mountain U.S.G.S. 7.5' quadrangle (Figure 7.2). The rather steep slope (30°) is strewn with talus, and it terminates at a terrace above Little Turkey Creek. Rockfall litters the mouth of the shelter. The west-facing shelter is small and narrow, measuring 8.4 m wide and 1.7 m from the dripline to the shelter's back wall. Vegetation at the site includes gooseberry, scrub oak, skunkbush, winterfat, grasses, prickly pear cactus, narrow-leaf yucca, mullein, skunkbush, pinyon, and juniper. West of the site in the Little Turkey Creek drainage, the vegetation opens to include mostly prairie grasses, scattered pinyon and juniper, cottonwoods, and willows. The closest water source is Little Turkey Creek, which is 250 m southwest from the site. Owing to its easy access from a well-used military road, the site has been visited by military personnel. There is a minor amount of historic refuse in the shelter. Otherwise, the shelter retains its integrity and exhibits little subsurface damage.

Surface Investigations

The shelter interior, the slope, and the alluvial terrace were inventoried for surface artifacts during the testing phase. One-hundred and nine flakes were field-analyzed along with four cores. Artifacts collected included six bifaces, four utilized flakes, three retouched flakes, two projectile points, one scraper, one core, one mano,



Cheyenne Mountain 7.5 Minute Quadrangle
Timber Mountain 7.5 Minute Quadrangle

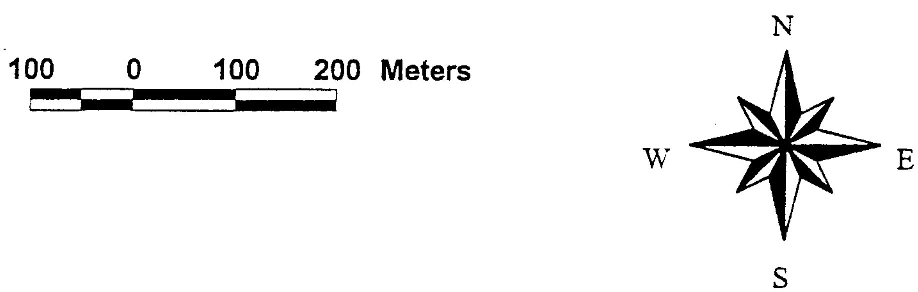


Figure 7.2. Location map, 5EP1345, FCMR.

and one tested cobble. The vast majority of surface artifacts were found on the slope in front of the shelter and along an old two-track road that runs parallel with the slope. After defining the site boundary, survey points were taken with a Total Station, and a site map was generated (Figure 7.3).

Subsurface Investigations

Subsurface investigations consisted of seventeen shovel tests and a single test unit.

Shovel Tests

Seventeen shovel tests were excavated along the alluvial terrace approximately 30 m below the rock shelter. Shovel tests were placed here to determine if the deep terrace alluvium might be covering buried cultural deposits. The shovel tests were excavated to culturally sterile sediments, to bedrock, or until the test hole could no longer be excavated with the available equipment (~70 cm). Two lines of shovel tests were excavated along the terrace. The distance between the shovel tests was four meters. Shovel tests were not excavated along the slopes in front of the shelter because the talus deposits impeded excavation. A test unit in the interior of the small shelter precluded shovel testing there.

Five of the seventeen (29%) shovel tests produced subsurface artifacts. The first shovel test line was placed perpendicular to the terrace tread. In this line, two of ten shovel tests recorded a small number of flakes. A second line began at the bottom of the slope and ran perpendicular to the terrace tread and ended at the army road. This second line bisected the first line at Shovel Test 1. Seven shovel tests were excavated along this line, three of which produced a small number of artifacts. For the most part, artifacts from the shovel tests were recovered from shallow depths (0 - 25 cm bgs). Although artifacts were recovered in five of the shovel tests, they are believed to have originated from the rock shelter and the talus slope in front of the shelter. They were recovered from colluvial and alluvial contexts. There was no indication of a buried cultural layer along the terrace.

Test Units

A single test unit was excavated in the interior of the small shelter. Results are summarized in Table 7.1.

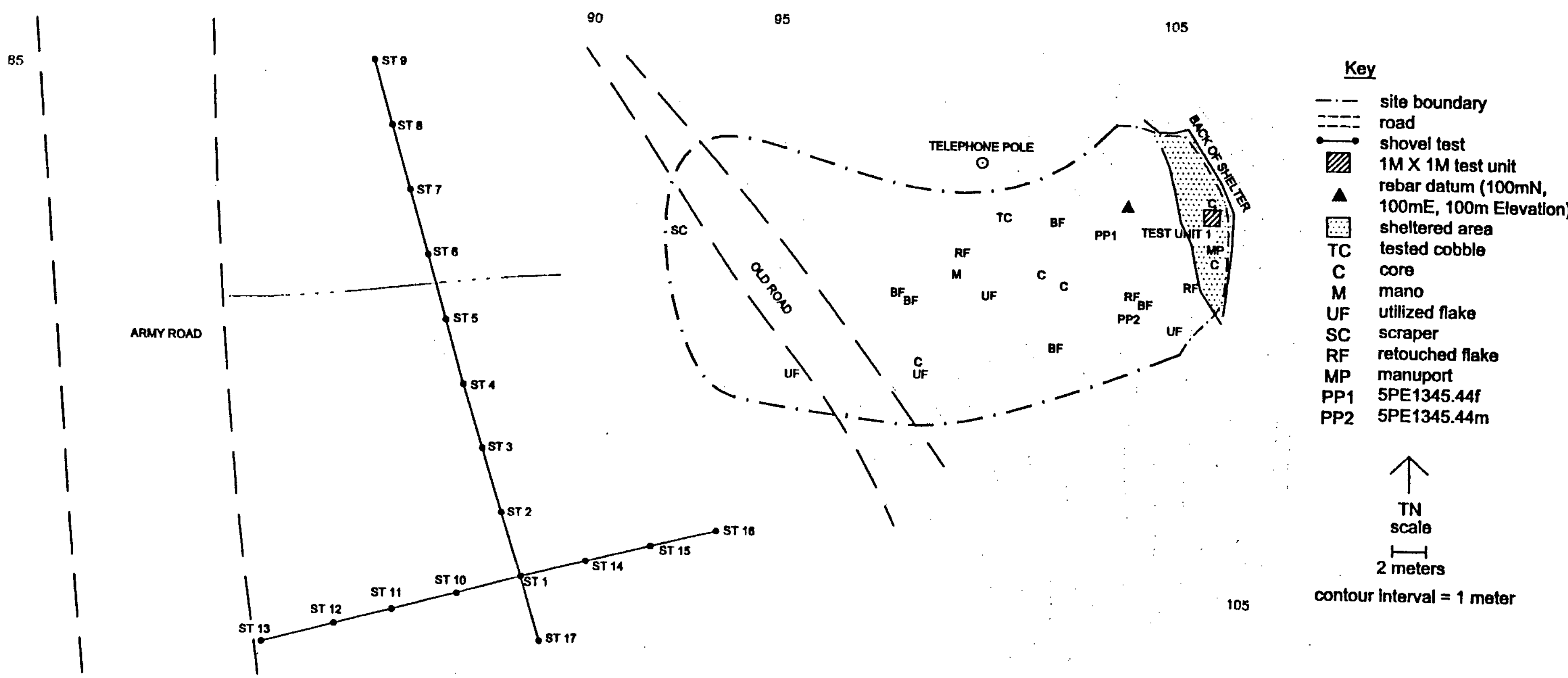


Figure 7.3. Site map, 5EP1345, FCMR.

Table 7.1. Test unit summary, 5EP1345, FCMR.

Test Unit No.	Layer	Level	Thickness Range (bgs)	Materials Recovered ¼"	Flotation sample
1	Surface		Surface	2 flaked-lithic artifacts, 1 core	No control sample
1	1	1	9.5-10 cm	48 flaked-lithic artifacts, 11 bone,1 core,2 bifaces, 3 utilized flakes	33 bone, seeds, ^{14}C sample, 31 flaked-lithic artifacts
1	1	2	10-12 cm	29 flaked-lithic artifacts, 1 core, 1 bone, 1 retouched flake, 2 utilized flake, 1 biface	77 bone, 1 bone tool, seeds, ^{14}C sample, snail, 58 flaked-lithic artifacts
1	1	3	6-7 cm	27 flaked-lithic artifacts, 1 core, 2 bone	96 bone, seeds, ^{14}C sample[1], 41 flaked-lithic artifacts
1	2	1	9-20 cm	6 flaked-lithic artifacts	29 bone, 1 bone tool, seeds, ^{14}C sample, 6 flaked-lithic artifacts
1	2	2	8-14 cm	74 flaked-lithic artifacts, 3 bifaces, 29 bone, 1 piece of mica	19 bone, seeds, ^{14}C sample[1], 8 flaked-lithic artifacts
1	3	1	12-15 cm	62 flaked-lithic artifacts, 36 bone, 1 bone awl, 3 bifaces	141 bone, 2 polished bones, seeds, ^{14}C sample, snail, shell, 129 flaked-lithic artifacts

Test Unit 1

This test unit was placed between the dripline and the rear wall near the middle and widest portion of the shelter. The datum for the unit was established in the northeast corner (100.13 mN, 105.54 mE, 0.25 masd). The control sample was taken from this corner as well. The unit was excavated in three stratigraphic layers to a maximum depth of between 62 and 65.5 cm below the ground surface.

Layer 1 was excavated in three levels within one stratigraphic layer. This bioturbated layer consisted of a loose fine sand with sandstone. Mixed with the sediments were abundant rodent droppings, organic material, which included unburned

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[1]Radiocarbon date obtained.

and partially burned branches, charcoal, bone, and a significant number of flaked-lithic artifacts. The layer extended to a maximum depth of between 21.5 and 29 cm below the ground surface before a layer change was made. Large pieces of sandstone were noted during excavation; these could represent bedrock or large roof spalls. Near the bottom of the layer, the sediments became finer; bioturbation lessened, and artifacts decreased. A ^{14}C sample on charred material collected from the flotation sample was submitted for radiocarbon dating, and it produced a calibrated 2–sigma radiocarbon age of 1155 - 920 BP (Beta 140334), with a calendar intercept date of AD 980 (Appendix VIII).

Layer 2 was slightly more compact and grayer, had better-developed soil structure, and was composed of fine sand with sandstone clasts. Bioturbation from packrats was observed in the layer. The artifact count decreased in the first level, but drastically increased in Level 2. Level 2/Layer 2 had more sandstone cobbles than Level 1. Bioturbation, although present, decreased as the sediments became sandier. Charred material collected from the flotation sample was submitted for radiocarbon dating. The sample provided a calibrated 2–sigma radiocarbon age of 1245 - 1040 BP (Beta 140325), with three calendar intercept dates of AD 815, AD 840, and AD 855 (Appendix VII). A layer change (Layer 3) was introduced at 49.5 to 51 cm below the ground surface when sediments became more charcoal-enriched and sandier.

Layer 3, a sandy loam to loamy sand, was excavated for 12 to 15 cm before the excavation was terminated. This layer yielded copious amounts of flaked-lithic artifacts and bone. Decomposing sandstone and cobble-size angular sandstone were common throughout. The darker sediment color of Layer 3 is a product of massive amounts of charcoal. Layer 3, along with Level 2/Layer 2 represents an *in situ* buried cultural horizon or ethnostratigraphic unit. Upon the conclusive identification of this buried ethnostratigraphic unit, replete with charcoal, artifacts, bone, and macrobotanical remains, excavations were terminated because eligibility had been firmly established. A chaining-pin probe confirmed at least 30 cm of sediments beyond the last level of excavations, which indicates at least a meter of total sediment depth in this portion of the shelter.

The east (west-facing) and the south (north-facing) wall profiles are illustrated in Figure 7.4. Three stratigraphic layers were identified in these profiles, and they are described below.

Stratum I — Stratum I is a grayish brown (10YR 5/2), fine sand with a small amount (10%) of silt. Sediments are primarily derived from granular disintegration of the sandstone overhang, with a lesser amount of eolian

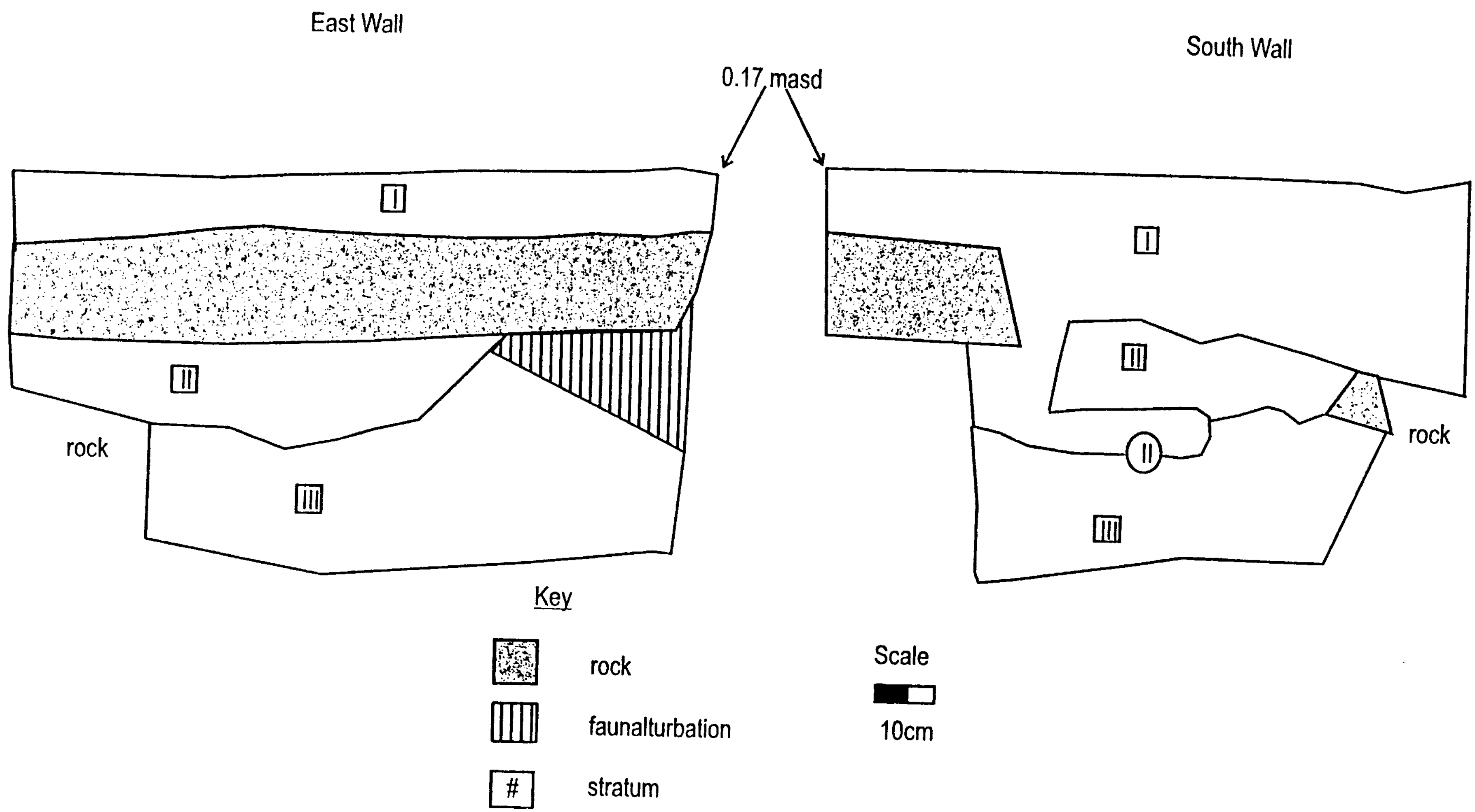


Figure 7.4. East-wall profile and south-wall profile, Test Unit 1, 5PE1345, FCMR.

sand and silt. Angular sandstone accounts for about 10% of the matrix. There is no soil structure, a result of the single-grain nature of the sediments. The lower boundary is clear and smooth. The sediments do not react to hydrochloric acid, and $CaC0_3$ was not noted. Bioturbation is fairly extensive, mostly visible as packrat excrement and litter. Charcoal and artifacts are mixed in this highly disturbed layer.

Stratum II — Stratum II is a brown to dark-brown (10YR 4/3) silty sand with an increase in the amount of silt (13%). The soil structure is weak and angular blocky, with silt films, worm casts, and root casts. The lower boundary is clear and smooth. The amount of larger angular sandstone increases in the stratum as the pebble-size sandstone decreases (< 5%). The sediments do not react to hydrochloric acid, which indicates a lack of $CaC0_3$. Bioturbation, which includes insect burrows, root casts, and packrat burrows, is present in the stratum. The weak soil structure and the presence of biological elements such as worm casts suggest that this stratum is a buried soil horizon (Ab). Artifacts were recovered throughout the stratum, but were concentrated in the lower level, perhaps indicating a buried cultural horizon older than the Stratum II soil.

Stratum III — Stratum III is a very dark-brown (10YR 2/2), fine sandy loam to loamy sand. It exhibits a weak, angular blocky soil structure. The lower boundary remains concealed. There is a very mild reaction to hydrochloric acid. There is some bioturbation, but it has decreased compared to the strata above. Large angular sandstone accounts for about 5% of the matrix. This layer represents a cultural horizon with extensive flaked-lithic artifacts, bone, charcoal, and organic specimens. Its darker color, a result of rich organic build-up, and the significant increase in artifacts identify this layer as a buried cultural horizon or ethnostratigraphic unit. The horizon or ethnostratigraphic unit extends beneath large roof spalls and below the level where excavations were terminated. The total depth of Stratum III is unknown.

Material Culture

A total of 677 artifacts comprises the flaked-lithic assemblage from this site. One hundred and thirty-one are from the surface and five hundred and forty-six are from the subsurface. One hundred and nine non-tool flaked-lithic artifacts were analyzed in the field along with four cores. The non-tool flaked-lithic assemblage represents all observed surface flakes. Eighteen tools were collected from the surface for further analyses. These include one mano, one scraper, one tested cobble, one core, two

projectile points, five bifaces, and seven unpatterned flaked-lithic tools. A manuport was collected from the surface, and a piece of mica was collected from the subsurface. Of the 546 subsurface artifacts, 7 were collected from shovel testing and the remainder were recovered from the test unit. The vast majority of the subsurface assemblage are non-tool flaked-lithic artifacts. The subsurface artifacts consist of 527 flakes, 10 bifaces, 6 unpatterned flake tools, and 3 cores. Quantitative data on the tools and cores are presented in Appendix III. Information on the groundstone is provided in Appendix IV.

Flaked-Lithic artifacts

Two projectile points were collected from the surface during the 1999 testing phase. Projectile point 5EP1345.44f is made from a white variegated chert. This specimen lacks the very tip and part of one tang (Figure 7.5). Other observable characteristics include convex blade edges, rounded shoulders, a rounded tang, a straight-to slightly-contracting stem, and a concave base. The distal half of one side of the blade exhibits intensive thinning. The point is bi-convex in cross-section. This projectile point is similar to a previously collected projectile point (Type VI B) from the FCMR (Alexander et al. 1982:106) and is also similar to Duncan projectile points that date from 2500 BC to 850 BC(Perino 1971:26). There are also similar examples (Type A) from excavations at the LoDaiska site (Irwin and Irwin 1959:23). Projectile points in Category P18 in Lintz and Anderson (1989:131), which resemble this specimen, date from between 3000 BC and 500 BC The major difference between specimen 5EP1345.44f and Category P18 examples is that the latter have slightly expanding stems. Based on the above comparisons, it is concluded that projectile point 5EP1345.44f probably dates to the Middle to Late Archaic periods.

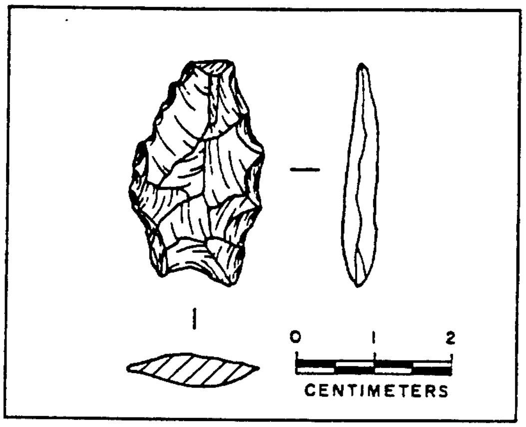


Figure 7.5. Projectile point 5EP1345.44f, FCMR.

The second projectile point is manufactured from locally available tan orthoquartzite. This artifact is a large stemmed projectile point that has a sharp tip, convex blade edges, an abrupt shoulder, a straight and wide stem, rounded tangs, a slightly convex base, and is bi-convex in cross-section (Figure 7.6). This specimen (5EP1345.44m) is missing one shoulder, and the stem is as long as the blade. No adequate comparisons were found in the reviews of literature from the FCMR or the PCMS. One explanation for the difficulty in making comparisons is that there is some

evidence that this projectile point was reworked and is not in its original form. This is based on flake scars found only near the tip of the blade, giving the point a blunt appearance.

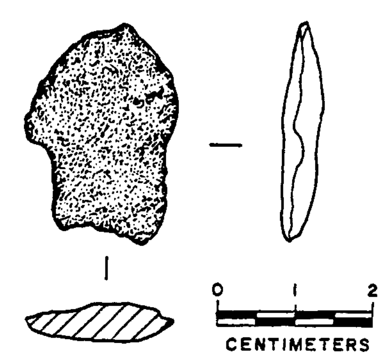


Figure 7.6. Projectile point 5EP1345.44m, FCMR.

Two projectile points and one point fragment were collected during past site documentation. A Hanna projectile point (5EP1345.1a) and a point fragment were recovered in 1990 when the site was originally recorded (Jepson et al. 1992:141). Hanna projectile points are associated with the Middle Archaic McKean complex. The point fragment was apparently too incomplete to type and was only mentioned in the report. A lanceolate projectile point base was collected from a trowel test during reevaluation of the site in 1997 (Charles et al. 1999b:6.22). This projectile point (5PE1345.43b) is collaterally flaked, and the hafting element is ground along the margins (Charles et al. 1999b:Appendix II.8). This projectile point fragment is consistent with Eden points described in Perino (1971:30).

Fifteen bifaces were recovered during testing; nine were found in the test unit, one was found in Shovel Test 16, and five were found on the surface. None of the bifaces has evidence of hafting, and all are smaller than 1". Three of the bifaces are complete, and the rest are incomplete to varying degrees. The three complete bifaces are made from chert and have a similar slightly pointed oval shape. The thickest biface has no evidence of edge retouching. The other two exhibit small amounts of bifacial retouching. The broken bifaces represent small unfinished patterned bifaces in the latter stages of manufacture. None of these broken bifaces exhibits observable use wear. Eight of the biface fragments are made from chert, three are made from silicified wood, and one is made from chalcedony. Six of the fragments are portions of small, thin patterned bifaces. Three are fragments of large, thick, unfinished bifaces. Three are fragmented and not identifiable but are most likely from thick unfinished bifaces. Three of the thin biface fragments and one of the thick bifaces display some evidence of utilization.

One light-brown chalcedony scraper with multiple uses was collected from the surface. This complete specimen has patterned unifacial flaking, creating a beveled edge along one end of the flake. There is evidence of unifacial use wear along the beveled edge. The thickness of the flake was beneficial in the creation of the beveled edge. One lateral edge of the flake has bifacial retouching and utilization.

Thirteen unpatterned flake tools are present in the assemblage. Seven were found on the surface, and six were recovered in the first two levels of the test unit. Nine of the tools are utilized flakes, and four are retouched flakes. Seven are broken, and only one has not been utilized. Three of the utilized flakes show bimarginal use wear, and the other six show only unimarginal use wear. Two of the retouched flakes have unimarginal retouching and bimarginal use wear. One retouched flake has unimarginal retouching and no evidence of utilization. The last retouched flake has bimarginal retouching and unimarginal use wear. Chert and silicified wood flakes account for ten of these tools. Only one of these tools is larger than 1". The modified tool edges on all the broken flakes extend to the break. This suggests that these expedient tools broke during use or manufacture.

One tested cobble and eight cores were analyzed. The tested cobble is a broken, water-worn quartzite cobble that has evidence of heat treating. Four of the five cores identified on the surface were analyzed in the field. A fifth core was collected from the surface of the test unit. The four non-collected cores exhibit multidirectional reduction. Of the four cores, two are chert, one is limestone, and one is orthoquartzite. The chert cores are the smaller cores, and both display extensive reduction. A chert core collected from the surface of the test unit is bidirectional and is nearly expended. The three subsurface cores were recovered from the first three levels of test unit excavation. Two of these are nearly expended chert cores. One is bidirectional and one is multidirectional. The third subsurface core is a bidirectional chalcedony core in the initial stages of core reduction.

Six hundred and thirty-six flakes were analyzed. They include 109 surface flakes and 527 subsurface flakes. All observed surface flakes were examined in the field and left. Data collected on the surface flakes were incorporated with the data from the subsurface analysis, and the resultant data are presented in Table 7.2. The test unit produced nearly 82% of the total flake assemblage. Only six flakes were recovered during shovel testing. Locally obtained raw material types dominate the sample, with chert being the most common (66%) type. Together, orthoquartzite, chalcedony, and chert material types account for nearly 97% of the flake assemblage. Simple flakes are the most prevalent flake type, but complex flakes account for one-third of the flake types. Shatter flakes and a small number of bifacial-thinning flakes are also present. The overwhelming majority of flakes have no visible cortex and are smaller then ½"; flakes over 1" are rare.

The combination of these characteristics is interpreted to be the result of an emphasis on late-stage reduction activities, which includes tool manufacture. The prevalence of generally smaller flakes with no cortex and the considerable number of

Table 7.2. Surface and subsurface non-tool flaked-lithic debitage, 5PE1345, FCMR.

Material	Quartzite/Orthoquartzite				Chert				Chalcedony				Silicified Wood			
Type	S	SS	Subtotal	%	S	SS	Subtotal	%	S	SS	Subtotal	%	S	SS	Subtotal	%
Size Grade																
>1"	2	2	**4**		1	1	**2**		1	0	**1**		0	0	**0**	
1/2" - 1"	4	6	**10**		32	17	**49**		2	1	**3**		0	0	**0**	
<1/2"	1	54	**55**		60	314	**374**		2	116	**118**		0	10	**10**	
Total	**7**	**62**	**69**	*10.8*	**93**	**332**	**425**	*66.8*	**5**	**117**	**122**	*19.2*	**0**	**10**	**10**	*1.6*
Flake Type (Ahler 1997)																
Shatter	1	14	**15**		22	54	**76**		0	2	**2**		0	0	**0**	
Simple	1	47	**48**		35	220	**255**		3	77	**80**		0	7	**7**	
Complex	5	1	**6**		36	53	**89**		2	34	**36**		0	3	**3**	
Bifacial Thinning	0	0	**0**		0	5	**5**		0	4	**4**		0	0	**0**	
Total	**7**	**62**	**69**	*10.8*	**93**	**332**	**425**	*66.8*	**5**	**117**	**122**	*19.2*	**0**	**10**	**10**	*1.6*
Cortex																
Present	2	3	**5**		34	45	**79**		3	8	**11**		0	0	**0**	
Absent	5	59	**64**		59	287	**346**		2	109	**111**		0	10	**10**	
Total	**7**	**62**	**69**	*10.8*	**93**	**332**	**425**	*66.8*	**5**	**117**	**122**	*19.2*	**0**	**10**	**10**	*1.6*
Flake Type (Sullivan and Rozen 1985)																
Complete	3	12	**15**		30	68	**98**		2	36	**38**		0	4	**4**	
Broken	2	11	**13**		29	51	**80**		1	21	**22**		0	1	**1**	
Flake Fragment	1	25	**26**		12	159	**171**		2	58	**60**		0	5	**5**	
Debris	1	14	**15**		22	54	**76**		0	2	**2**		0	0	**0**	
Total	**7**	**62**	**69**	*10.8*	**93**	**332**	**425**	*66.8*	**5**	**117**	**122**	*19.2*	**0**	**10**	**10**	*1.6*

S Surface
SS Subsurface

Table 7.2. Surface and subsurface non-tool flaked-lithic debitage, 5PE1345, FCMR (cont).

Material	Hornfels/Basalt				Limestone				Siltstone				Total	
Type	S	SS	Subtotal	%	S	SS	Subtotal	%	S	SS	Subtotal	%	No.	%
Size Grade														
>1"	1	0	1		0	1	1		0	0	0		9	1.4
1/2" - 1"	0	0	0		0	2	2		2	0	2		66	10.4
<1/2"	0	0	0		0	3	3		1	0	1		561	88.2
Total	1	0	1	0.2	0	6	6	0.9	3	0	3	0.5	636	100
Flake Type (Ahler 1997)														
Shatter	0	0	0		0	2	2		0	0	0		95	14.9
Simple	1	0	1		0	4	4		3	0	3		398	62.6
Complex	0	0	0		0	0	0		0	0	0		134	21.1
Bifacial Thinning	0	0	0		0	0	0		0	0	0		9	1.4
Total	1	0	1	0.2	0	6	6	0.9	3	0	3	0.5	636	100
Cortex														
Present	0	0	0		0	0	0		0	0	0		95	14.9
Absent	1	0	1		0	6	6		3	0	3		541	85.1
Total	1	0	1	0.2	0	6	6	0.9	3	0	3	0.5	636	100
Flake Type (Sullivan and Rozen 1985)														
Complete	1	0	1		0	2	2		2	0	2		160	25.2
Broken	0	0	0		0	0	0		0	0	0		116	18.2
Flake Fragment	0	0	0		0	2	2		1	0	1		265	41.7
Debris	0	0	0		0	2	2		0	0	0		95	14.9
Total	1	0	1	0.2	0	6	6	0.9	3	0	3	0.5	636	100

S Surface
SS Subsurface

complex flakes are primary characteristics of late-stage reduction activities. The presence of simple flakes with cortex implies middle-stage reduction activities as well. Although middle stage reduction activities occurred at the site, they did so with less frequency. Interpretations about the assemblage using Sullivan and Rozen's (1985) categories echo the previous interpretation; tool manufacturing was the primary flaking activity at the site. This conclusion is supported by the high number of flake fragments combined with the high number of broken flakes. Sufficient numbers of complete flakes and debris indicate that core reduction was also taking place. The presence of several cores justifies this interpretation.

The various flake categories in subsurface and surface contexts were compared to ascertain whether there were any differences in percentages between the two. A few general observations were noted. The test unit excavation clearly indicates a predominance of smaller artifacts, with over ninety percent smaller than ½". The higher percentage of the smaller flakes is a direct result of the flotation sample taken from each level of the test unit. Of the 273 flakes recovered from the flotation samples, 85.7% could have fallen through the conventional ¼" mesh. Comparisons by raw material indicate that chert is more common on the surface, with more of a mix of material types in the subsurface. Complex and simple flakes occur equally on the surface, but simple flakes occur more often than complex flakes in the subsurface. Because of the higher number of small flakes in the test unit, it is not surprising that a higher percentage of subsurface flakes has no cortex. Smaller flakes are indicative of late stages of reduction, after the cortex has been removed. Flake fragments are more common in the subsurface. The combination of flake fragments and broken flakes attests to the interpretation that tool manufacturing was a primary activity at the site.

<u>Groundstone</u>

One large quartzite mano fragment (5EP1345.44h) was collected. A little over 50% of the mano remains. This mano is 2 cm thicker than the average thickness of the other manos collected during the 1999 testing phase. The quartzite mano is a worn cobble, smoothed on two surfaces and battered around the edge.

<u>Manuport and Mineral Specimens</u>

One flat, circular-shaped gneiss pebble was collected as a manuport. This material type does not occur naturally in the immediate site area and was therefore transported to the site. One edge of the pebble is broken. A small amount of battering is present on the unbroken edge. The battering is probably natural in origin. One mineral sample, a piece of mica, was found in the test unit. The mica may also have

been transported to the site.

Ceramics

A sherd was collected from the surface during the 1998 site reevaluation conducted by FLC. This is the only sherd thus far identified at the site, and it is described in the reevaluation report (Charles et al. 1999b:Appendix II.42-43). The sherd is very small and plain, and is culturally unidentifiable. See Appendix I (this report) for a discussion of the ceramic assemblage from the FCMR.

Faunal

A total of 490 pieces of bone were recovered from the test unit. Of the total assemblage, 73 are unidentifiable. The majority (66%) of bone from the heavy flotation samples belongs to various rodent (*Rodentia*) species and was deposited in the site naturally. Other identified animal species in the sample include *Bison, Odocoileus, Avis,* and *Sciuridae*. Two bone awls and one polishing tool were made from long-bone shaft fragments from medium-sized mammals. These tools are indicative of household activity. Thirty-one pieces are burned. Three of the 31 are from mammals, one is from bird, and the reminder are from rodents. Two polished bone fragments are from medium-sized mammals. A complete list of all faunal remains recovered from the site is available in Appendix V.

Macrobotanical

Four samples were submitted for macrobotanical analysis. These samples included the entire light fraction content of the control samples. The results of macrobotanical analysis are presented in Appendix VI.

Summary and Conclusions

The test unit excavated under the shelter at the site indicates that subsurface cultural deposits are present. Flaked-lithic artifacts, bone, and charcoal were recovered from every level. In Level 1/ Layer 2 there was a dramatic drop in the overall number of artifacts. The levels above Level 1/Layer 2 had a fairly consistent amount of material, which then decreased in this level. The next two levels showed a marked increase in artifacts, with the last level doubling the number of flaked-lithic artifacts from the preceding level. The excavation was terminated at this point, because the presence of undisturbed significant buried deposits had been established. A chaining-pin probe at the base of the unit indicated at least 30 cm of remaining sediments with the potential

for more buried cultural deposits.

Shovel tests along the alluvial terrace below the shelter were not productive; six flakes and one biface were recovered from five of seventeen shovel tests. Artifacts from shovel tests were found at relatively shallow depths, from 0 to 25 cm below ground surface. The shovel testing showed that although artifacts are present along the alluvial terrace, they are few in number and occur in shallow contexts. We interpret the artifacts along the alluvial terrace as having arrived in their present position through alluvial and colluvial processes from the main site area above. There is no indication of a buried cultural deposit along the terrace.

Temporally diagnostic artifacts from the site suggest multiple occupations of the shelter from possibly the Late Paleo Indian to the Late Prehistoric stages. The previously collected Eden projectile point was recovered from a shallow trowel test and could represent a curated artifact. All the other projectile points were recovered from the surface. The two charcoal samples from buried contexts produced radiocarbon ages from 1200 to 900 BP, which is within the Developmental period (Zier and Kalasz 1999). Because excavations were not continued to bedrock, there is a good probability that even older cultural remains are present in the shelter. How much older is up to speculation, but similar shelters on the FCMR, such as Recon John (Zier 1989) and Gooseberry (Kalasz et al. 1993), have demonstrated Middle and Late Archaic occupation. Mammal bones from 5PE1345 suggest that the occupants were subsisting on, among other resources, deer, rodents, small- and medium-size mammals, squirrels, birds, and possibly bison. The shelter possesses excellent potential for paleoenvironmental data. The site's position above Little Turkey Creek affords a choice setting for conducting geoarcheological and paleoenvironmental studies, which would add greatly to our knowledge of the alluvial history of the FCMR as previously described for Red Creek (Kuehn 1998) and Turkey Creek (Madole 1989, 1990). The site has the potential to yield significant information under Criterion D, 36CFR60. It also has the potential to yield information on the Paleo Indian and Early Archaic periods as defined in the CRMP (Zier et al. 1997) and on the research themes of chronology and cultural relationship, settlement pattern, prehistoric economies, horticulture, paleoclimates, technology and material culture, and geomorphology (Zier et al. 1997).

Continued research at this site should be directed toward completing the test unit to bedrock, collecting additional ^{14}C samples, and the collection and analysis of pollen, soil, and flotation samples for paleoenvironmental reconstructions. The site is recommended as eligible for nomination to the NRHP under Criterion D of 36CFR60; the potential to yield significant archaeological data. The site has been determined to

contain significant *in situ* buried deposits, and is a stratified multicomponent site with Paleo Indian, Archaic, and Developmental periods represented. It has the potential to yield information on the research themes of chronology and cultural relationships, settlement patterns, the nature of prehistoric economies, horticulture, paleoclimates, technology and material culture, and geomorphology as defined in the CRMP (Zier et al. 1997).

CHAPTER 8
5PE750

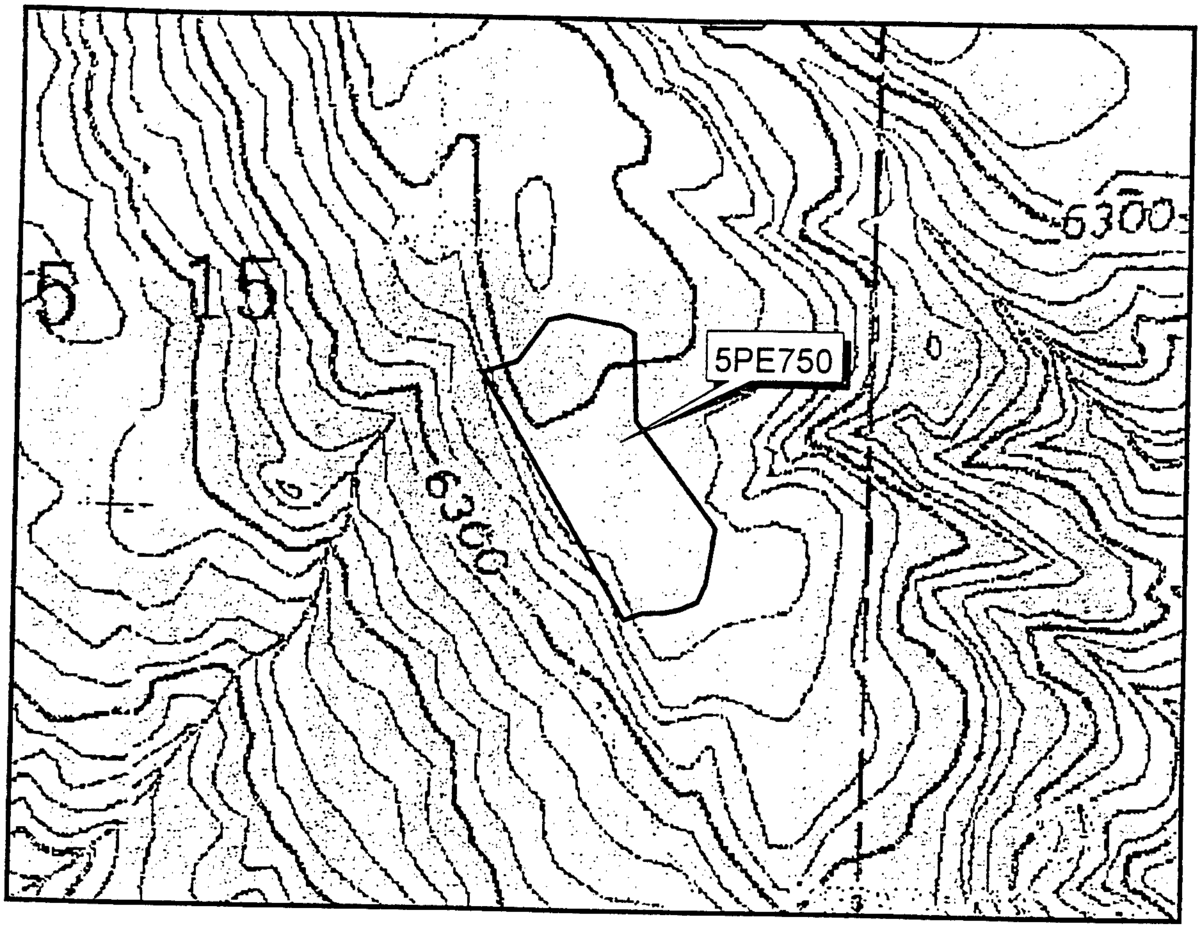
Introduction

Site 5PE750, a prehistoric open architectural site, was first recorded by CA in 1985 (Zier et al. 1987). It was originally recorded as a stone-circle site with an associated flaked-lithic scatter. Three complete and four partial stone circles, some with up to eight courses of sandstone, were recorded along with a large natural sink, which provides the closest water.

The site was twice reevaluated by FLC, once in 1995 (Charles et al. 1997), and a second time in 1997 (Charles et al. 1999b). During the 1995 inventory of portions of Booth Mountain, sites 5PE749 and 5PE750 were identified at the edge of the FLC project boundary. Artifacts between the sites, although light, were continuous. A reevaluation form was completed for 5PE750, wherein it was recommended that sites 5PE749 and 5PE750 be included as a single site (Charles et al. 1997:6.87-88). In addition to discovering more artifacts than were originally recorded, two previously unrecorded rock-art panels were discovered. One rock-art panel consists of two circular designs with lines through them and the second embodies a series of branching lines. Accordingly, the site boundary was enlarged to include the rock-art panels and all of site 5PE749.

FLC visited the site again in 1997 as part of a cultural resource reevaluation project. Other than a few more artifacts on the surface, no changes were noted. The site was again recommended as eligible for nomination to the NRHP (Charles 1999b:6.52). This site type is the only one of its kind identified along the western edge of Booth Mountain. The features resemble those of sites dated to the Developmental and Diversification periods along the Turkey Creek drainage (Charles et al. 1999b; Zier et al. 1988; Zier and Kalasz 1985; Van Ness et al. 1990). The site was recommended as eligible for nomination to the NRHP since it has the potential to yield significant information on the research themes of prehistoric economies, settlement and subsistence, architecture, chronology and cultural relationships, and perhaps horticulture, as defined by Zier et al. (1997). It was recommended that the site be avoided and protected and that it be tested to determine temporal affiliation and function. It was again recommended that 5PE749 and 5PE750 be considered a single site.

This expansive site (35,047 m^2) is situated on the Stone City, U.S.G.S. 7.5' quadrangle (Figure 8.1) It comprises nine stacked-stone features, two rock-art panels,



Pierce Gulch 7. 5 Minute Quadrangle
Stone City 7. 5 Minute Quadrangle

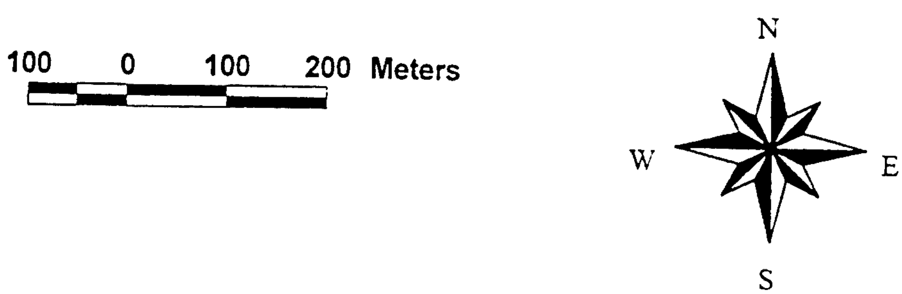


Figure 8.1. Location map, 5PE750, FCMR.

and a light scatter of flaked- and ground-stone artifacts. It is at the top of the gentle south slope of Booth Mountain along the west edge and above a sheer sandstone cliff face. The site has a commanding view to the west of the Sangre de Cristo Mountains. A sink or tank in the bedrock forms a natural water catchment basin, which collects runoff from storms and snowmelt (Figure 8.2). This natural feature is perhaps the incentive for the location of the site. Elevation at the site is 6,400 ft (1,951 m) asl. Slope at the site is a gentle 0 - 2°, and it is within a thick pinyon, juniper, and Gambel's oak forest with ponderosa pine, mullein, moss, and grasses. The site is in excellent condition, with light disturbance from natural erosion and light military trash.

Figure 8.2. View of catchment area (sink), 5PE750, FCMR. View is to the southeast.

Surface Investigations

The 1999 surface investigation began initially by walking 2- m-wide transects, flagging all prehistoric artifacts and features. Over the course of surface reconnaissance it was determined that the artifacts continued beyond the original site boundary of 5PE750, extending into previously recorded sites 5PE748 and 5PE749, which lay to the east-northeast and southeast. Dean (1992) states that artifacts less than 20 m apart should be considered a single site. Following this methodology (Dean 1992) for defining site boundaries, all three sites, 5PE748, 5PE749, and 5PE750, are included as a single site. Therefore, a field decision was made to include all three as a single site and

to adjust eligibility testing to include the larger site area.

A site map was constructed with the Total Station in which sites 5PE748 and 5PE749 were included in the single site 5PE750 (Figure 8.3). Eight subdatums were necessary to map the entire site. The seven previously identified stacked-stone features were mapped, in addition to two previously undocumented stacked-stone features, Features 8 and 9. The features, along with all of the visible surface tools, and the two rock art panels were mapped.

As a result of the testing phase, a sample of 172 flakes were field analyzed along with four cores and a metate. Artifacts collected for further analysis included five projectile points, four bifaces, four retouched flakes, two scrapers, one chopper, and a mano.

The two rock-art panels were mapped, and although they had been previously described, it is appropriate to repeat these descriptions in this report. Rock Art Panel 1 is at the north end of the site and along the site boundary. This panel consists of two abstract elements that are solid pecked into the sandstone cliff. The elements are circular with pecked interior lines (Figure 8.4). This panel faces west. Rock Art Panel 2 is within the sink. It is comprised of two abstract elements that are solid-pecked on the sandstone walls of the sink. These elements resemble arrows, with one arrow superimposed over the other (Figure 8.5). This panel faces southeast.

Nine stacked-stone features in various states of preservation are present at the site (Figure 8.6). These architectural features are similar to features at Avery Ranch (5PE56), Mary's Fort (5PE649), Suzie's Place West (5PE926), the Butler site (5PE1120), 5PE60, and 5PE63 along the Turkey Creek drainage, and at the Sullivan Butte (5PE889) site and 5PE1606 along the north face of Booth Mountain. Although similar features have been referred to elsewhere (cf. previous citations), we have opted to refer to these as stacked-stone features as opposed to structures due to the ambiguity surrounding the function of the stacked-stone features at 5PE750.

Feature Descriptions

The nine-staked stone features were mapped and are described as follows.

Feature 1 Feature 1 is a circular stacked-stone feature; however, only about half of the circular wall remains (Figure 8.7). The wall is constructed mainly of large tabular sandstone rocks (> 20 cm), with smaller rocks interspersed, some as small as 5 cm in

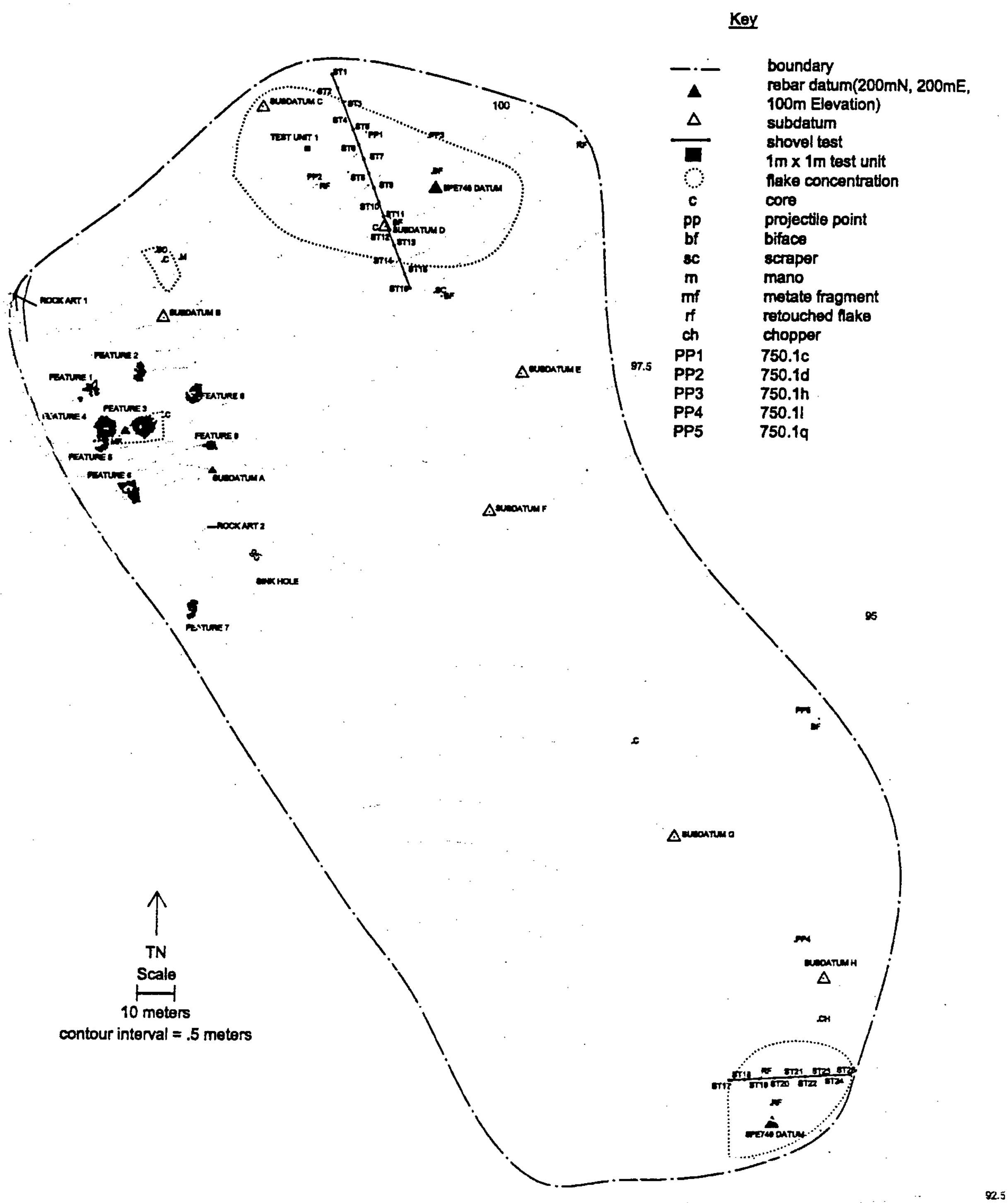


Figure 8.3. Site map, 5EP750, FCMR.

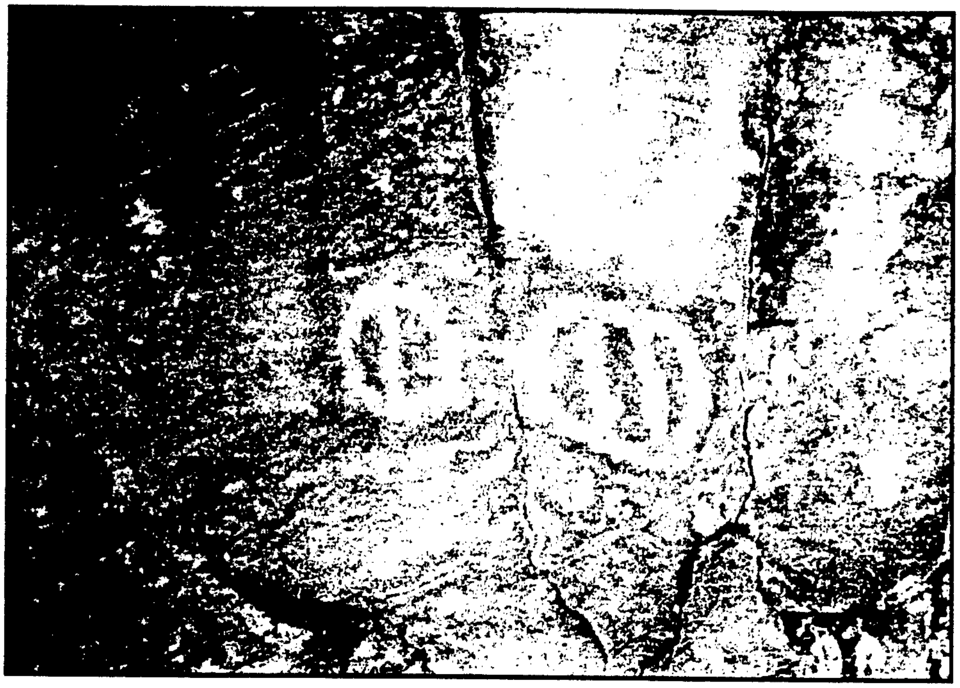


Figure 8.4. Rock Art Panel 1, 5PE750, FCMR. View is to the east.

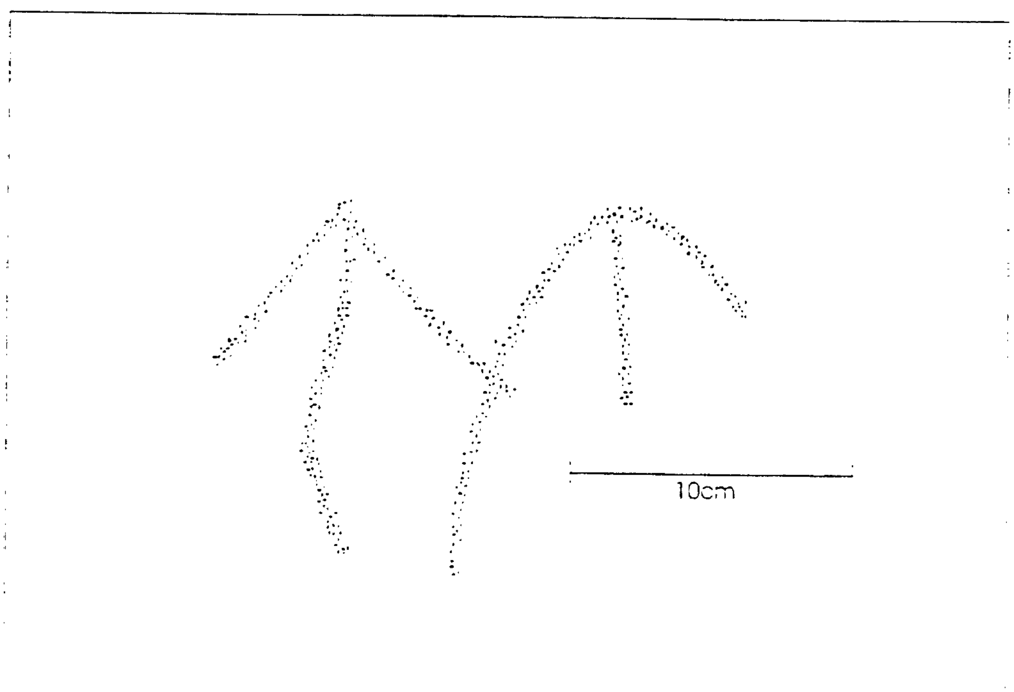


Figure 8.5 Rock Art Panel 2, 5PE750, FCMR.

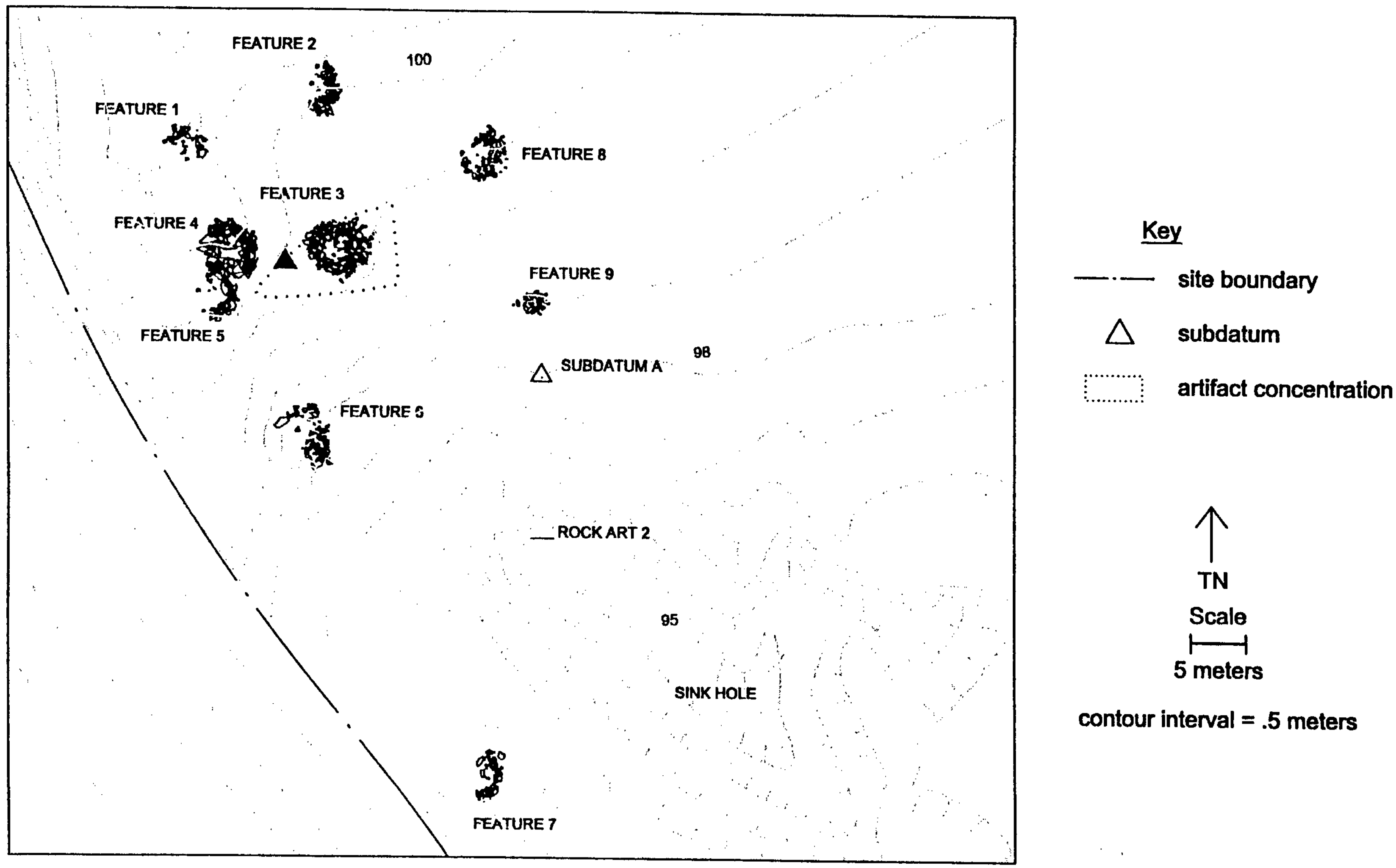


Figure 8.6. Inset map of stacked-stone features, 5PE750, FCMR.

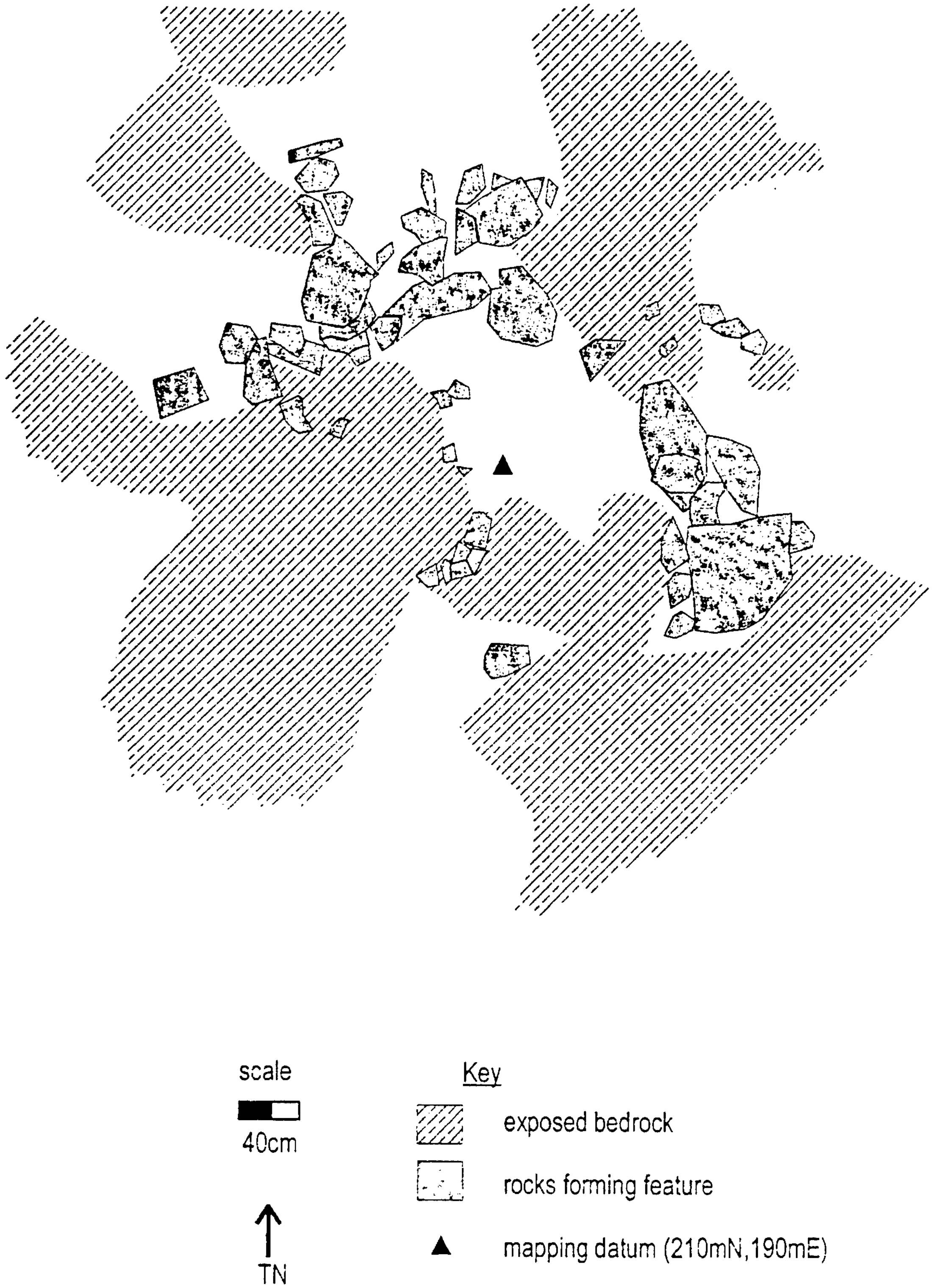


Figure 8.7. Planview, Feature 1, 5PE750, FCMR.

width and height. From one to four courses are apparent. The height of the wall varies, but in the north and east (at its highest) it is 80 cm. The outside diameter is about 3.6 m from the northwest to the southeast. Within the feature, the deposition ranges from bedrock to 15 cm in depth.

Feature 2 Feature 2 is a half-circle of stacked-stone approximately 30 to 60 cm high with a north–south diameter of approximately 5 m between the outer edges (Figure 8.8). The tabular sandstone rocks, which are heavily incrusted with lichen, are concentrated along the eastern half of the feature. Although the west half of the feature is dominated by a stand of scrub oak, which precluded detailed inspection of this side of the feature, there is no wall visible along this side. Two to four sandstone courses are present. Bedrock is exposed to the north and to the south. Within the feature is a layer of humus and grasses. Deposition within the feature is a maximum of 10 cm in depth.

Feature 3 Feature 3 consists of a circular, stacked-stone feature about 5.5 m in diameter (Figure 8.9). Maximum height is about 50 to 55 cm. The wall in positioned on bedrock for most of its circumference. The west wall has fallen outward, while the east and south walls seem mostly intact, with some material falling both to the interior and exterior of the feature. A low portion in the north wall is suggestive of a doorway. This possible doorway is associated with a tree tip—the tree fell away from the feature—and a large root intersects the wall at this opening. Another break in the wall near the southwest portion of the feature may represent a second doorway. In portions of the east wall, small stones are stacked about seven courses high. In the west wall, large stones (30+ cm thick) constitute a large portion of the wall. The maximum courses in the west wall number two to four. An unusual number of large flat slabs (30 x 50 cm or larger) are positioned along the top of the south and east walls. No prehistoric cultural material was observed within the feature, although several pieces of debitage are present outside the feature. A metal can was found within the feature. Soil depth within the feature is estimated at less than 15 cm.

Feature 4 Feature 4 is a stacked-stone feature that forms over half of a circle (Figure 8.10). The sandstone rocks of the feature are encrusted with lichen. Feature 4 intersects with Feature 5 along its south edge. The diameter of the feature is approximately 4.8 m to the outer edges. Courses of the wall range from one to four with no prevalence for any number within that range. Portions of the feature incorporate elevated sections of the surrounding bedrock. The maximum height of the feature wall is 90 cm. Stones are less concentrated along the southern boundary of the

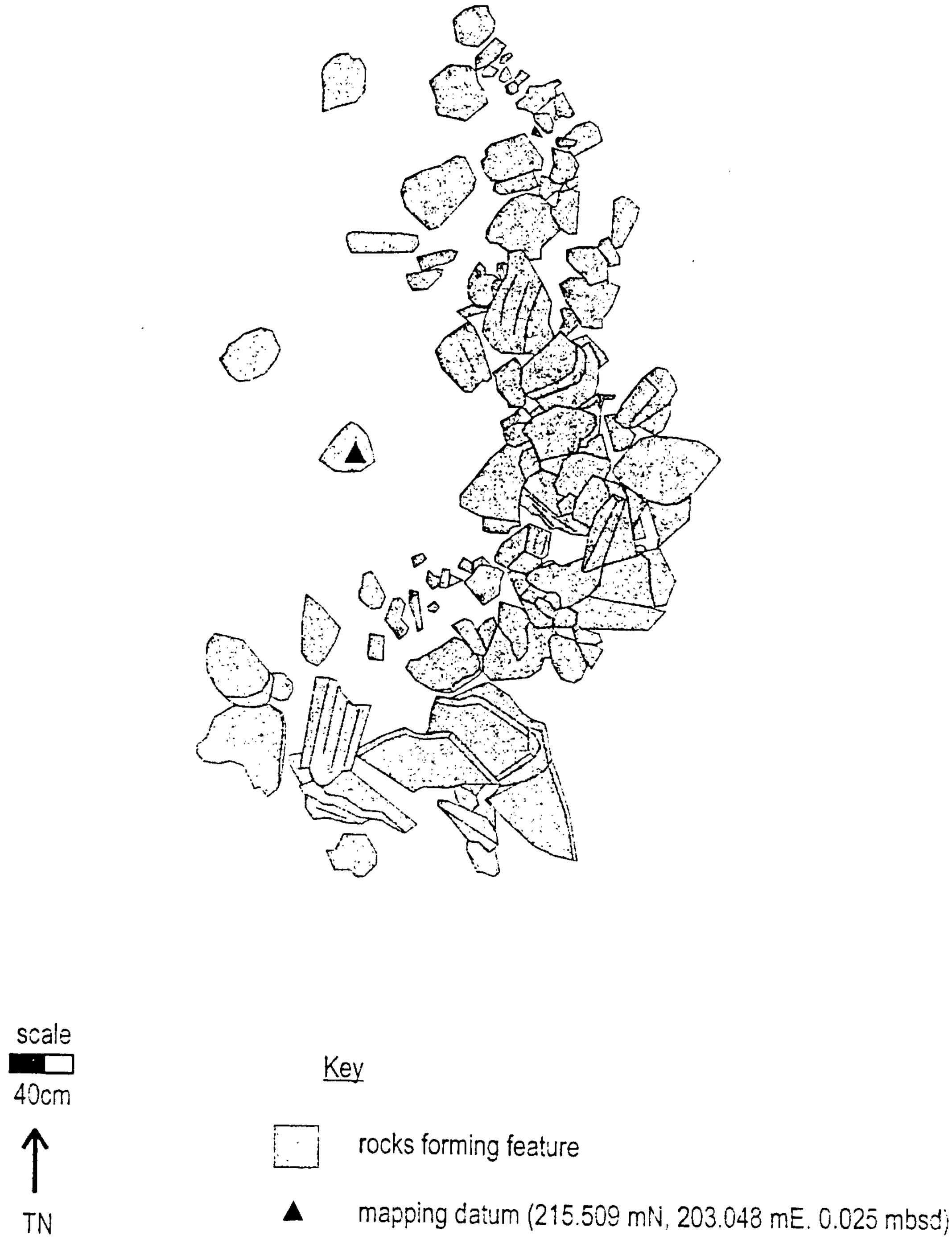


Figure 8.8. Planview, Feature 2, 5PE750, FCMR.

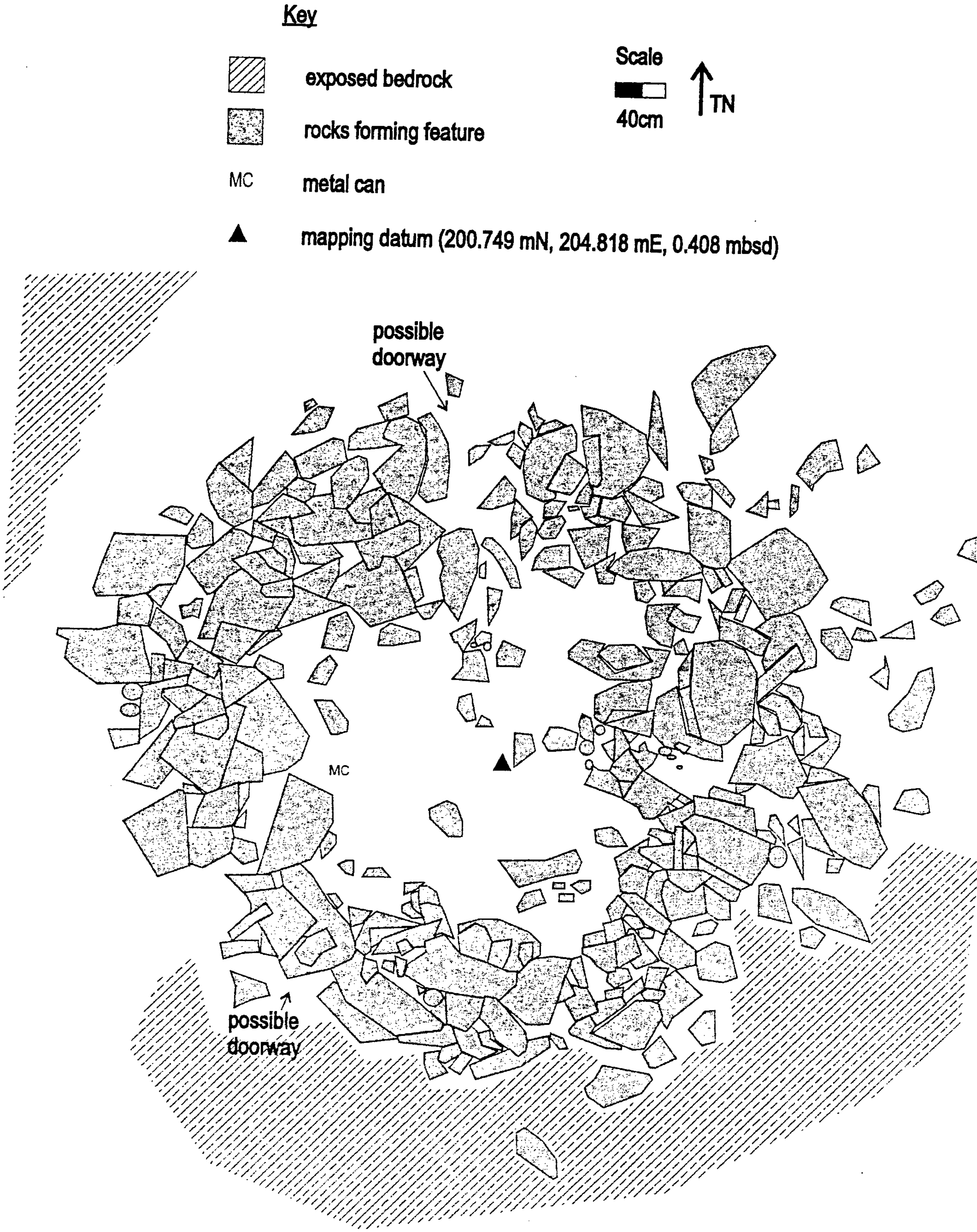
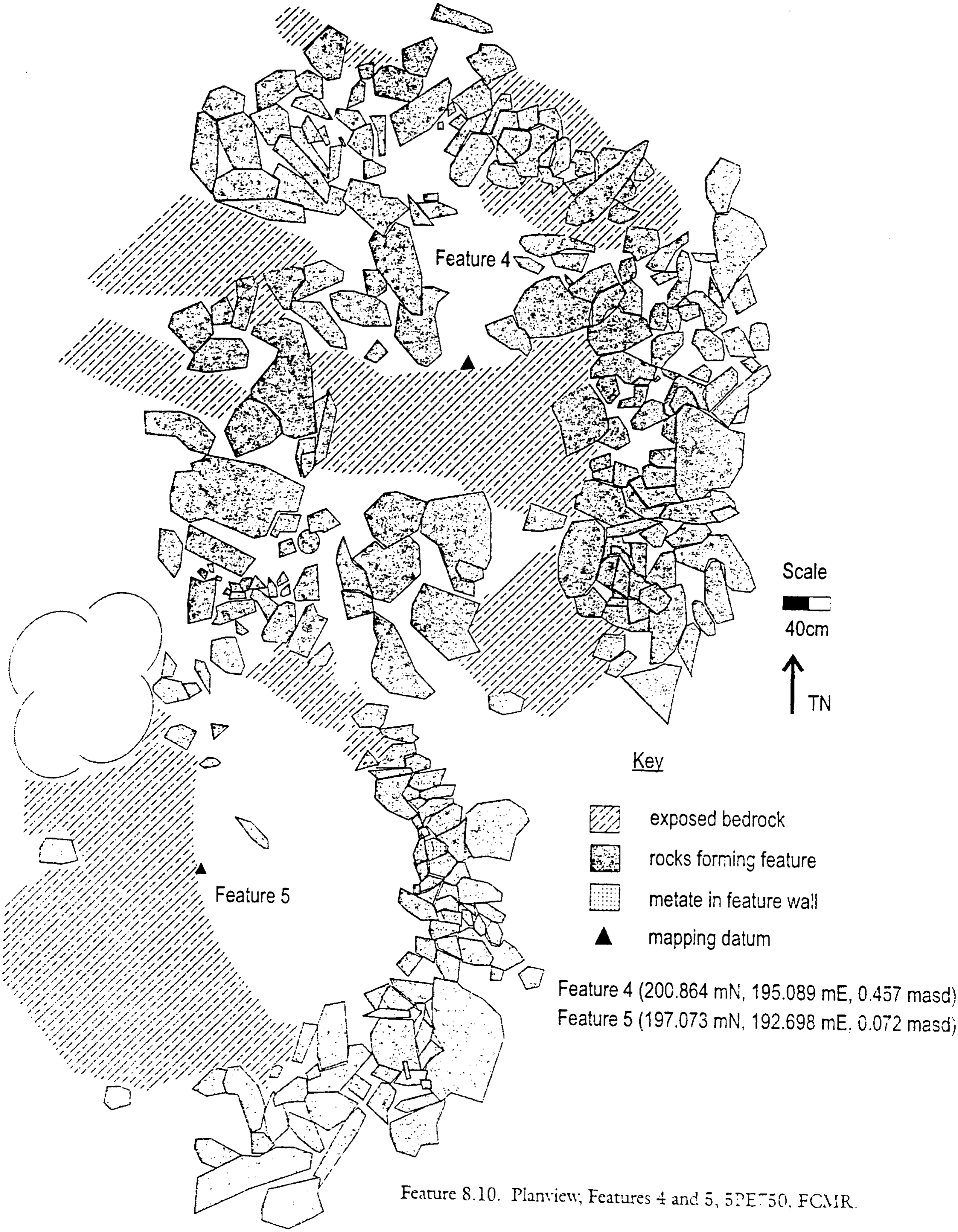


Figure 8.9. Planview, Feature 3, 5PE750, FCMR.



Feature 8.10. Planview, Features 4 and 5, 5PE750, FCMR.

feature where it intersects with Feature 5. Bedrock is exposed in all directions surrounding the feature and almost entirely across the surface within the feature's interior. There is slight sediment deposition within pockets and cracks in the bedrock. To the northeast, directly outside of the feature boundary, is a stand of scrub oak.

Feature 5 Feature 5 is a circular stacked-stone feature formed from lichen-encrusted tabular sandstone and positioned on top of bedrock (Figures 8.10 and 8.11). Feature 5 intersects Feature 4 along its north edge, and they may have been connected at one time. The entire wall appears slumped, and from north to south it measures about 6 m long (outside edges). An east–west measurement is difficult because there is no visible wall to the west. Wall courses vary from one to five, with a maximum wall height of 80 cm. At its highest point, a complete metate, with the grinding side facing

Figure 8.11. Stacked-stone Feature 5, 5PE750, FCMR. View is to the south.

outward, is incorporated into the wall. A juniper tree is growing from the northwest wall of the feature. Also to the south and west is a large, fallen tree. There is a shallow deposit of about 6 to 7 cm in the deepest portion (the northeast) of the feature. Bedrock borders the west side of the feature.

Feature 6 Feature 6 is an arc of stacked sandstone interpreted to be a shallow feature (Figure 8.12). The walls range from one to three courses, with a maximum wall height of 48 cm. The east wall seems to have fallen both in and out of the feature.

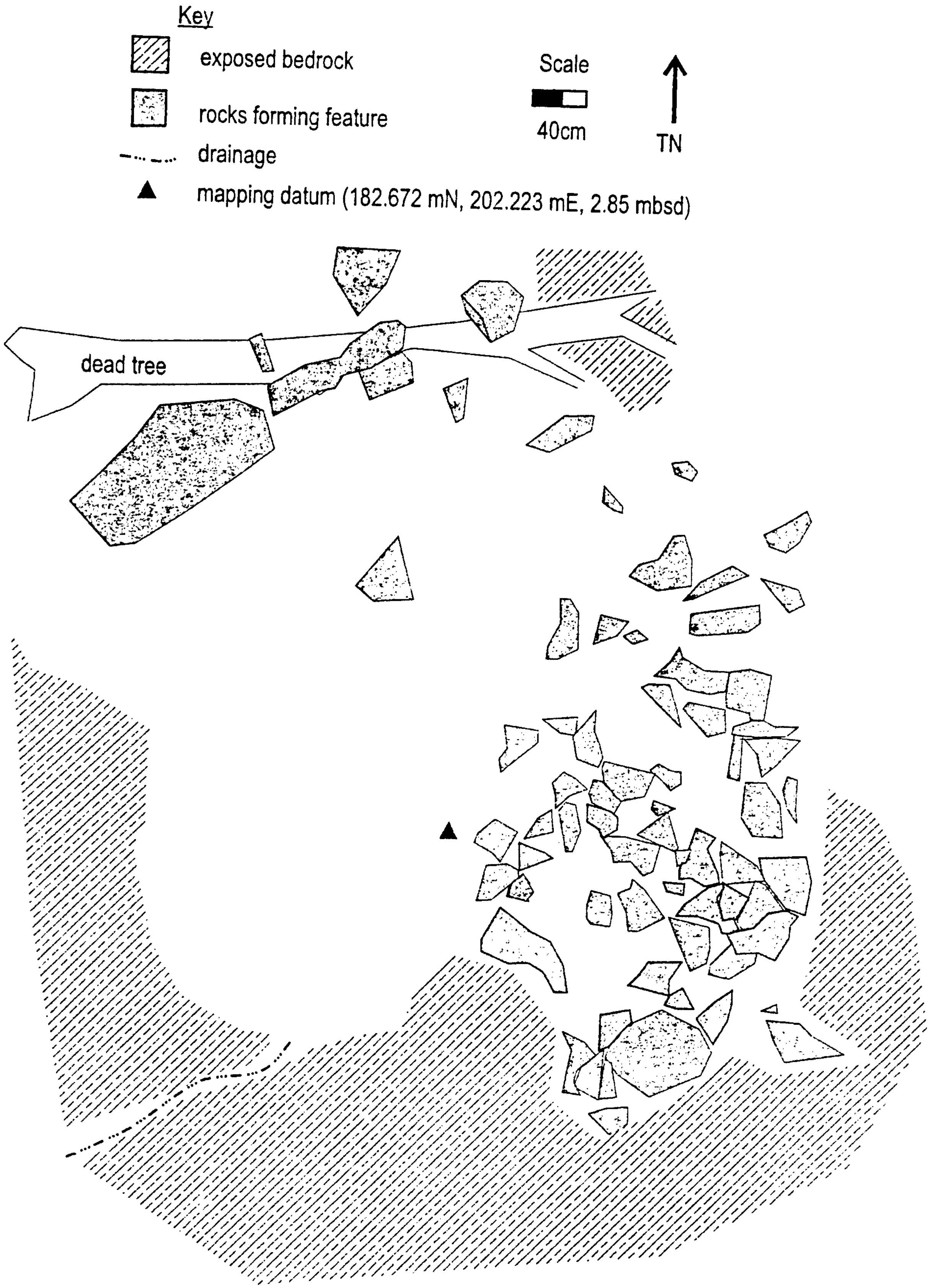


Figure 8.12. Planview, Feature 6, 5PE750, FCMR.

Along the north wall there is a fallen tree. The rock sizes range from 15 to 75 cm. There is a layer of humus directly overlying bedrock, and some sediments have collected in the cracks in the bedrock. A small gully flows from north to south through the middle of the feature.

Feature 7 Feature 7 is an arc of stacked tabular sandstone interpreted to be a shallow feature (Figure 8.13). Wall courses range from one to three. Incorporated into portions of the feature are elevated sections of the surrounding natural bedrock. The maximum height of the feature is 33 cm, with a diameter of approximately 4 m to the outer edges. Stacked stones are virtually absent in the southwest, but the natural bedrock is elevated sufficiently to create the same effect as stacking. Bedrock is exposed in all directions surrounding the feature as well as within the feature's interior. There is light sediment deposition within pockets and cracks in the bedrock. To the northeast, directly outside of the feature, is a tree. Rocks of the feature and the surrounding bedrock are encrusted with lichen. A metal can was found along the west side of the feature.

Feature 8 Feature 8 is a circular enclosure of tabular sandstone (Figure 8.14). The north and east walls have tumbled outward. The west wall is marked by only a few stones. The south wall is notable only because of the large number of small stones (<10 cm diameter). Rocks along the southern edge lie on exposed bedrock. Along the east wall the large slabs reach four courses in height. Most of the remaining walls are two courses or less. No door opening is visible, but a lack of stones along the west wall suggests an opening. The maximum wall height is 37 cm, and this is along the north wall. Sediment depth in the northern portion of the feature is 20 to 25 cm, and decreases to the south. In the western portion, sediment depth is approximately 20 to 30 cm.

Feature 9 Feature 9 is a small, rectangular stone feature that lacks a west wall (Figure 8.15). The remaining walls hint at having fallen outward. There is one course of stone in the walls with a single upright slab. The maximum height of the walls is 62 cm. The feature is mainly on bedrock, with a maximum of 20 cm of sediment depth in some areas. The rock sizes range from 15 to 70 cm. There are four suspicious stumps around this feature, which could be associated with it, although the purpose of these remains inconclusive.

Subsurface Investigations

Twenty-five shovel test and one test unit were excavated at the site.

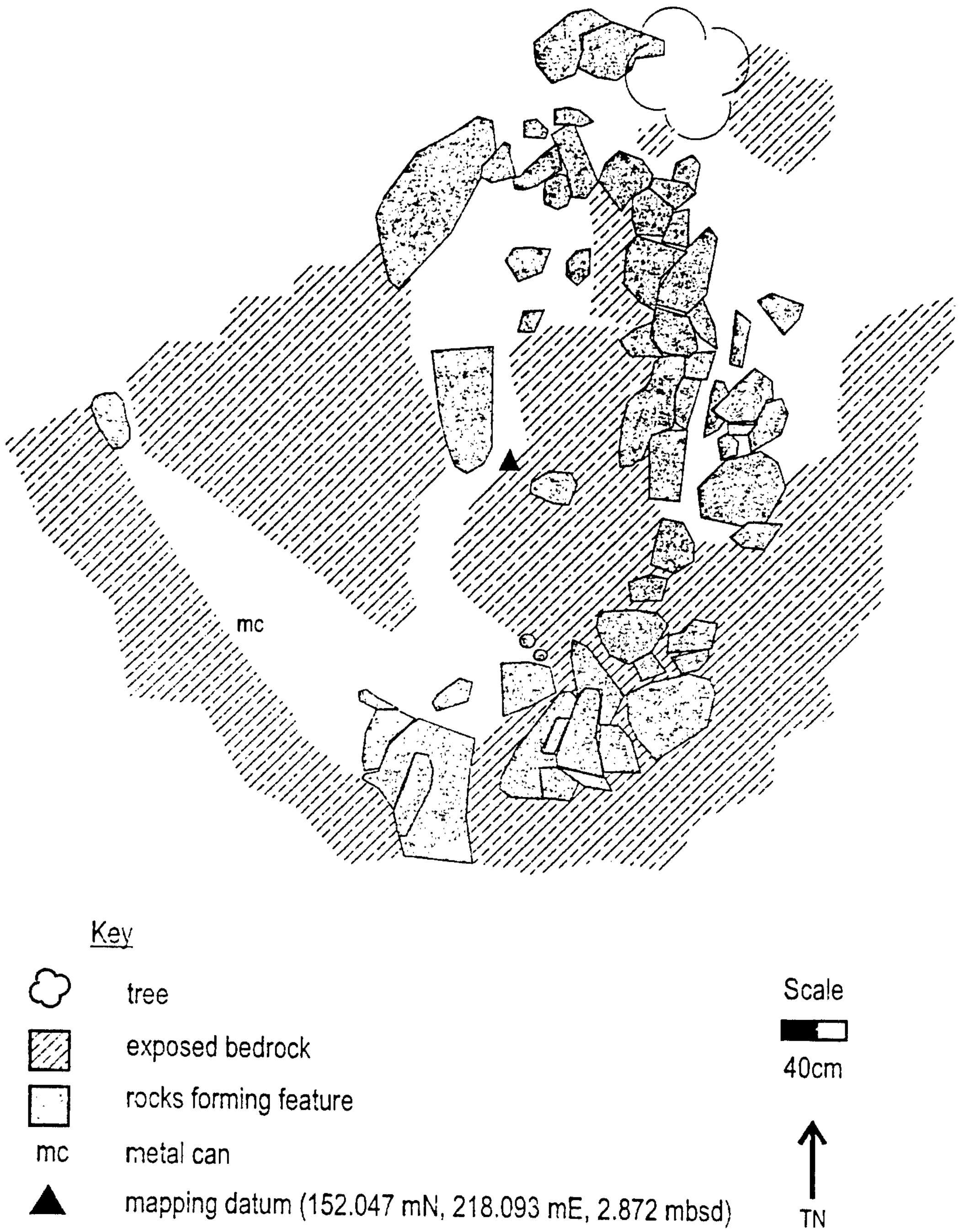


Figure 8.13. Planview, Feature 7, 5PE750, FCMR.

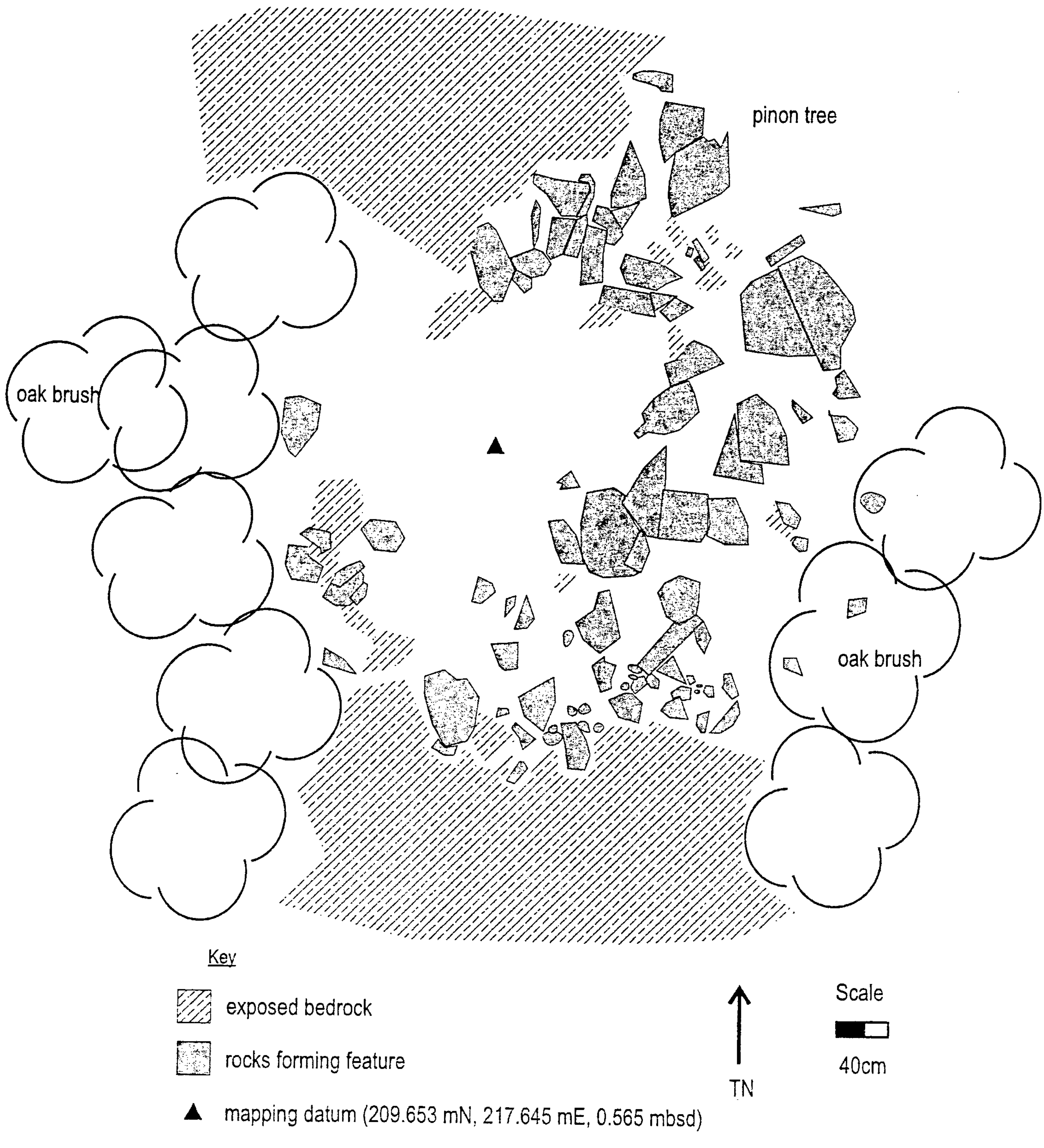


Figure 8.14. Planview, Feature 8, 5PE750, FCMR.

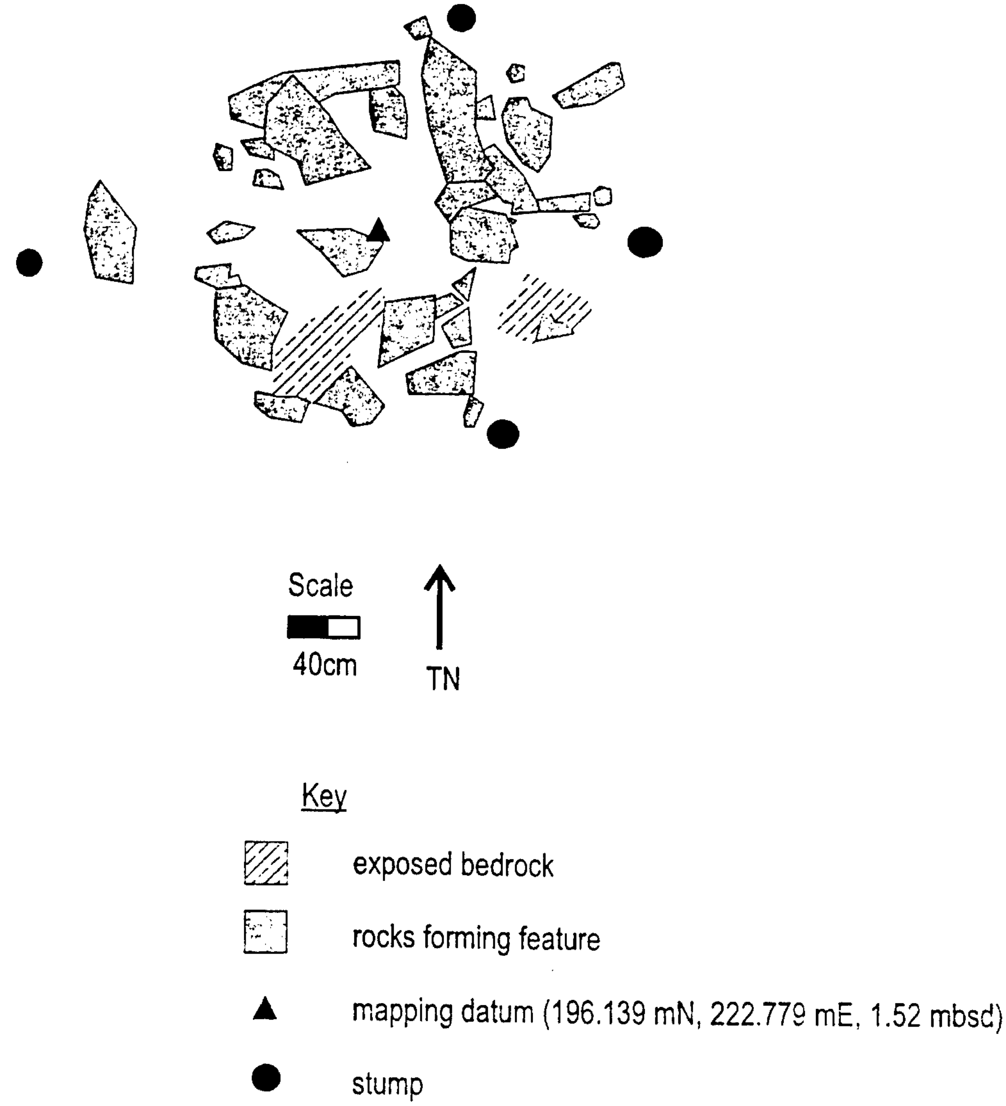


Figure 8.15. Planview, Feature 9, 5PE750, FCMR.

Shovel Tests

Shovel tests were executed in two areas of the site, the northeast and the southeast. These two areas were originally defined as separate sites (5PE748 and 5PE749, respectively), but they are now included within site 5PE750. These locations were chosen for subsurface testing as opposed to the area surrounding the features because these areas consist mostly of exposed bedrock with little or no potential for subsurface depth. Shovel tests were placed a distance of 4 m apart. They were excavated to culturally sterile sediments, to bedrock, or until the test hole could no longer be excavated with the available equipment (~70 cm). It was concluded that subsurface testing in the areas of sediment deposition away from the features might reveal the extent of the subsurface deposits of the greater site area, perhaps narrowing the management recommendations.

A single line of sixteen shovel tests was excavated in the northeastern portion of the site and within the boundary of the previously recorded site 5PE748. Flaked-lithic artifacts were recovered from eight shovel tests (50%). Most artifacts were recovered from depths between 0 and 25 cm below the ground surface. Based on the results of shovel testing, a test unit was excavated in this portion of the site.

A second line of shovel tests was excavated in the southeastern corner of the site, and within the boundary of previously identified site 5PE749. Nine shovel tests were excavated in a single line from west to east in the area of artifact concentration. No subsurface artifacts were recovered from these tests, and additional testing was not conducted in this portion of the site. Details of shovel test stratigraphy are presented in Appendix II.

Test Unit

A single test unit was excavated in the northeast portion of the site that was previously defined as site 5PE748 in an area where sediment deposition held the potential for subsurface deposits. This unit was placed within an artifact concentration, and in the area where shovel testing had produced buried artifacts. Test unit results are summarized in Table 8.1.

Test Unit 1

The datum was placed in the northwest corner (274.49 mN, 246.42 mE, 1.54 masd), and the control unit was excavated from this corner as well. The unit was excavated in four layers until sandstone bedrock was encountered between 35 and

Table 8.1. Test unit summary, 5PE750, FCMR.

Test Unit No.	Layer	Level	Thickness Range (bgs)	Materials Recovered 1/4"	1/16" Control
1	1	*	2-5 cm	1 flaked-lithic artifact	No control sample
1	2	1	2-10 cm	3 flaked-lithic artifacts	4 flaked-lithic artifacts
1	2	2	6.5-7.5 cm	4 flaked-lithic artifacts	1 flaked-lithic artifact
1	3	*	10-11.5 cm	None	None
1	4	1	8-13 cm	None	None

* Excavated as a single stratigraphic layer.

44 cm below the ground surface. Layer 1 was thin (2 - 5 cm), with loose sand and sod roots. A single flake was recovered from this sod layer. Layer 2 was excavated in two levels for a total depth between 11.5 and 20 cm below the ground surface. Twelve artifacts were recovered from this layer, which became drier, more compact, and with larger tree roots deeper in the profile. Cobble-size sandstone rocks were numerous in Layer 2. A layer change was introduced when the brown sand was replaced by reddish brown sand. At the top of Layer 3, large pieces of sandstone were exposed. The sediments in this layer were very compact and deepest in the southeast corner. At about 10 cm into the layer, the sediments became lighter colored with increasing gravels and decomposing sandstone but no artifacts. A layer change was initiated at this point to Layer 4, which was predominately weathered sandstone and was about 15 cm thick before consolidated bedrock was encountered. Tree roots continued in the layer. Artifacts were not recovered from Layers 3 and 4.

The west (east-facing) and north (south-facing) wall profiles are illustrated in Figure 8.16, and they are described below. Five strata were identified in the unit, and they closely conform to the layers followed during excavation.

Stratum I — Stratum I is a light brownish gray (10YR 6/2) sand. It is loose, fine, and has a single grain soil structure (sod layer). The lower boundary is wavy and clear. Grass roots are common, as are angular to subangular sandstone pebbles (2% - 5%). The sediments do not react to hydrochloric acid. Artifacts occur in the stratum.

Stratum II — Stratum II is a brown (10YR 5/3) fine sand with a small amount of silt.

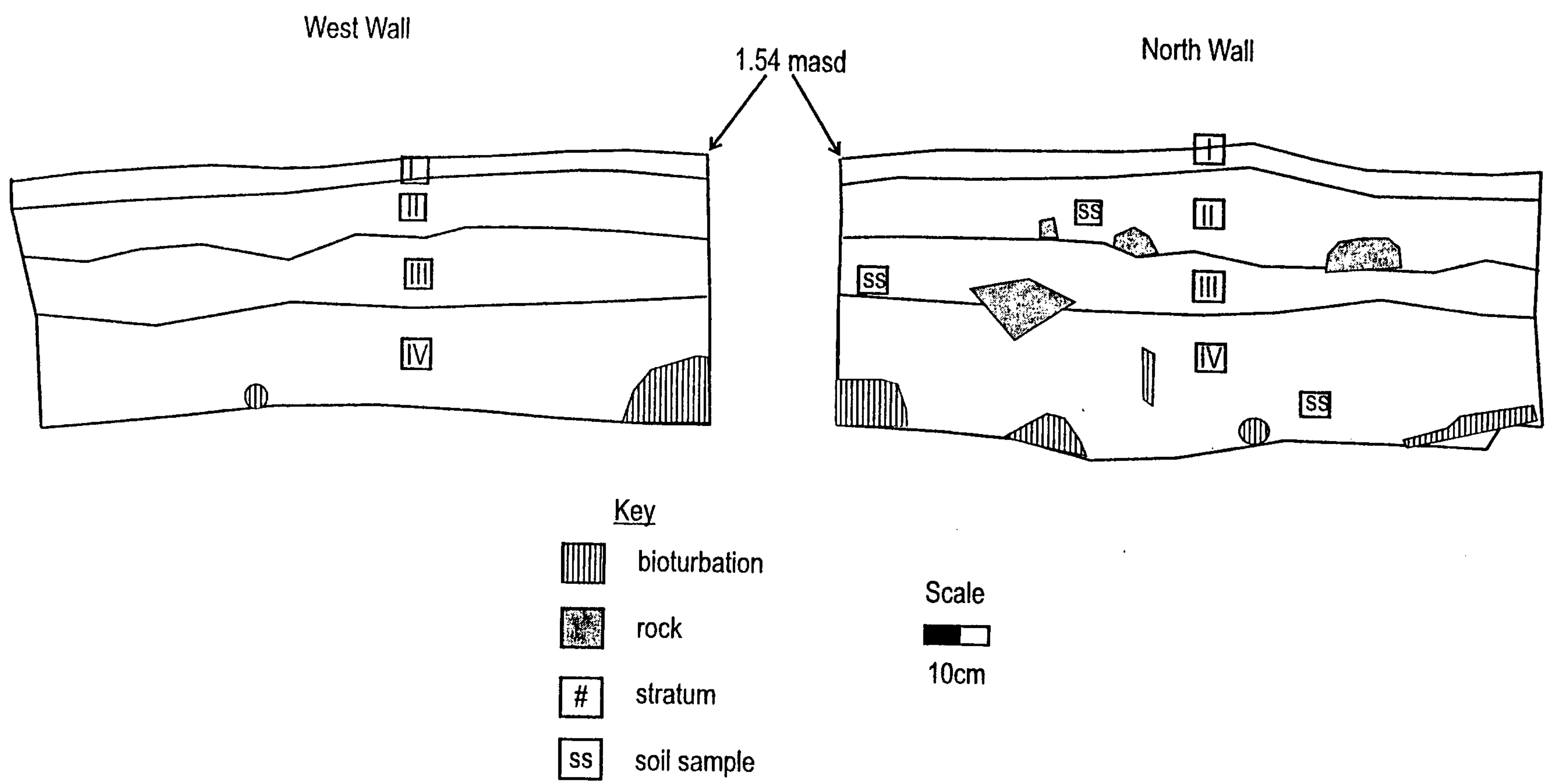


Figure 8.16. West-wall profile and north-wall profile, Test Unit 1, 5PE750, FCMR.

Pedologic structure is moderately developed and subangular blocky. The lower boundary is clear and wavy. Noticeable bioturbation includes tree and grass roots. Angular to subangular sandstone pebbles and cobbles account for 2% to 5% of the total matrix. There is no reaction to hydrochloric acid. Artifacts occur throughout the stratum.

Stratum III — Stratum III is a dark, yellowish brown (10YR 4/6) fine sand with a very small amount of silt. The peds are well developed and angular blocky. The lower boundary is clear and wavy. Tree roots are numerous in the stratum. Angular and subangular sandstone pebbles and cobbles account for between 2% and 5% of the matrix. There is a slight reaction to hydrochloric acid. Artifacts are present in this B soil horizon.

Stratum IV — Stratum IV, which ranges between 15 and 21 cm thick, is a pale brown (10YR 6/3) sand with a small amount of silt. The soil structure is single-grain. The lower boundary is abrupt and smooth with the underlying bedrock. A dense mat of roots lies along the contact with the bedrock. The sediments react violently to hydrochloric acid. Gravels range in size but are consistently formed from disintegrating sandstone bedrock. They account for 70% to 90% of the total layer. No artifacts occur in this C soil horizon.

Stratum V — Sandstone bedrock ® horizon). Stratum V does not appear on the profile drawing.

Material Culture

One hundred and seventy-two pieces of non-tool flaked-lithic debitage, five projectile points, four bifaces, two scrapers, four retouched flakes, one chopper, one mano, one metate, and four cores are included in the following discussion. This debitage assemblage represents only a sample of the total surface assemblage. The flakes, the metate, and the cores were analyzed in the field. The flaked-lithic tools and the mano were collected. A total of twenty-five artifacts was recovered from subsurface investigations. These consist of twenty-four flakes and a core fragment. Slightly under half of the subsurface artifacts were recovered during shovel testing, with the remainder recovered from Test Unit 1. Quantitative information on the flaked tools and cores are presented in Appendix III. Information on the mano is presented in Appendix IV.

Flaked-Lithic artifacts

All five projectile points were collected from the surface of the site. The first projectile point (5PE750.1c) is made from locally available tan orthoquartzite. The artifact is missing the tip and one tang. This large, stemmed projectile point (Figure

8.17) has an elongated triangular blade, straight to slightly convex blade edges, rounded shoulders, a slightly expanding stem, a rounded tang, a rounded or convex base, and a bi-convex cross-section. The blade margins are more extensively flaked on one side than on the other. Category P9 examples (Lintz and Anderson 1989:123), which date to either the time periods 3300 BC - 2800 BC or to 1000 BC - AD 1000, resemble this point. A very similar projectile point (5PE648.83c) was recovered from excavations at Recon John shelter (Zier 1989:139), where it is referred to as a Type 10 projectile point, and this point type dates to the Late Archaic period. Type H specimens from the LoDaiska site (Irwin and Irwin 1959:22) are also similar. The above comparisons suggest that specimen 5PE750.1c probably dates to the Late Archaic period.

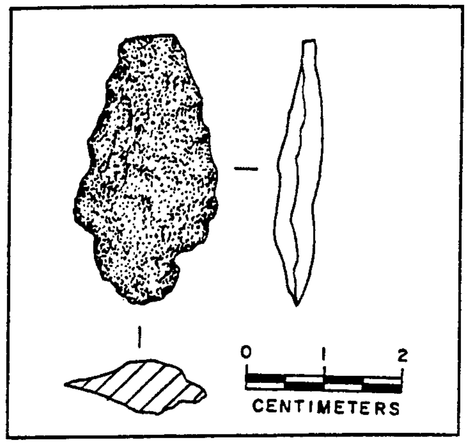


Figure 8.17. Projectile point 5PE750.1c, FCMR.

The second projectile point (5PE750.1d) is manufactured from white chert. It is missing the blade tip, one tang, and the very tip of one shoulder (Figure 8.18). Morphological characteristics include a broad triangular blade with straight to convex edges, a short neck, an abrupt shoulder, a straight to slightly contracting stem, a rounded tang, a concave base, and a bi-convex cross-section. This projectile point is similar to Category P18 specimens in Lintz and Anderson (1989:131), although it does not have an expanding stem. Category P18 specimens are reported to date between 3000 BC and 500 BC This projectile point is also comparable to Duncan points (Perino 1971:26), even though the shoulders are more rounded on the Duncan point. However, projectile point 5PE750.1d may best resemble Type A specimens from the LoDaiska site (Irwin and Irwin 1959:22). Based on the preceding comparisons, projectile point 5PE750.1d plausibly dates to the Late Archaic period.

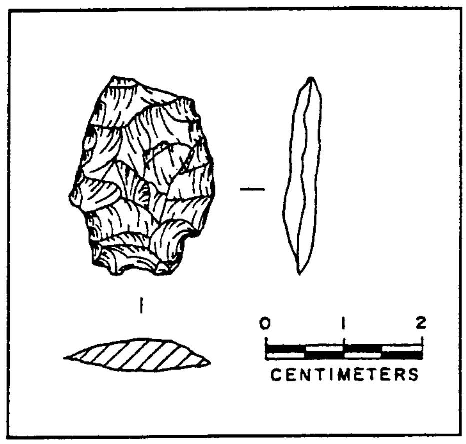


Figure 8.18. Projectile point 5PE750.1d, FCMR.

A third projectile point(5PE750.1h) is made from gray orthoquartzite that can be procured locally. This specimen is missing nearly half of the blade, one tang, and the tip of the shoulder. Although little of the blade edges remain, they were probably straight to slightly convex. Other characteristics include abrupt shoulders, a straight to

slightly expanding stem, a rounded tang, and a bi-convex cross-section. This crudely made point exhibits little evidence of flake scarring, and its maker appears to have utilized the natural shape of the flake. Although fragmentary, this artifact compares favorably with another point (5PE750.1c) also collected at the site. Both may date to the Late Archaic period.

The fourth projectile point (5PE750.1l) is a small flanged-stemmed specimen manufactured from brown orthoquartzite. The top third of the blade and the tip of one tang are missing (Figure 8.19). From what remains, it appears the blade edges were either straight or slightly convex. Other noted characteristics include abrupt shoulders, pointed tangs, expanding flanged stem, a slightly concave base, and a bi-convex cross-section. This specimen compares with examples from Category P79 in Lintz and Anderson (1989:211), which date between AD 1000 and AD 1750. Examples of this projectile point have been previously documented at both the FCMR and at the PCMS. Several of the comparable projectile points from the PCMS are from a site with structural remains. One projectile point is from a structural site with an associated hearth that dates to AD 1380 (Lintz and Anderson 1989:213). Several examples of similar projectile points have been recovered from sites at the FCMR. Type 6 (Kalasz et al. 1993:65), Type 8 (Van Ness et al. 1990:161), and Type II from Avery Ranch (Zier et al. 1988:133) are comparable. These similarities indicate that this projectile point dates from the late Developmental to the early Protohistoric periods.

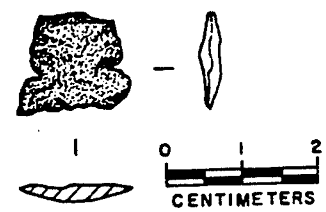


Figure 8.19. Projectile point 5PE750.1l, FCMR.

The final projectile point (5PE750.1q) discussed is a small expanding-stemmed specimen made from gray chert. This specimen (Figure 8.20) is nearly complete except for a small chip out of one blade edge. The point has a sharp tip, a triangular blade with slightly convex edges, weakly barbed shoulders, a short expanding stem, pointed tangs, a slightly convex base, and is bi-convex in cross-section. Examples of this point type are represented at the FCMR and at the PCMS where it resembles Category P62 examples (Lintz and Anderson 1989:193), which date between AD 500 and AD 1400. Other projectile points from the PCMS found in Loendorf and Loendorf

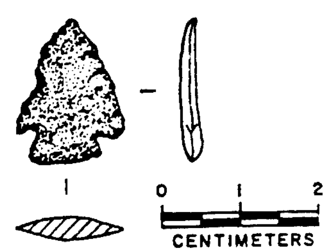


Figure 8.20. Projectile point 5PE750.1q, FCMR.

(1999:64) and in Loendorf et al. (1996:90) are morphologically similar. Projectile points from the FCMR with similar characteristics include Type IV-E (Alexander et al. 1982:99) and Type 14 from Recon John shelter (Zier 1989:141). This projectile point is suggested to date from the Developmental or Diversification periods.

The four bifaces are broken and none appear to have been hafted. The largest biface fragment is made from locally procured orthoquartzite. This biface represents most of the blade of a large, unfinished, patterned biface in the early stage of manufacture. The specimen is moderately thick; one side has marginal evidence of thinning, but the other side has not been thinned. There is no cortex present on the specimen. The blade edges exhibit a small amount of retouch flaking and one edge possesses evidence of utilization. Another of the biface fragments is a tip made from brown chalcedony. There is evidence of bimarginal use wear. Although the remaining two fragments cannot be refitted, they may be part of the same red chert biface. Both fragments possess light crazing and small potlids that may be the result of heat alteration. One of the fragments is from near the distal end of the blade, although the very tip is missing. The other fragment is part of the base and possible straight stem of a Eden-like projectile point. This supposition is based on two lines of evidence, the parallel flaking pattern and the ground stem margins. So little of the original artifact remains that it is arguable whether the point belong to the Paleo Indian period, and even if it is a Paleo Indian artifact, it may have been curated.

Two scrapers, a complete side scraper and a broken end scraper, are included in the flaked-lithic tool assemblage. The side scraper (5PE750.1j) is made from a light-brown orthoquartzite flake. This complete specimen (Figure 8.21) exhibits patterned unifacial flaking along one lateral edge. The substantial thickness of the flake was beneficial in the creation of its beveled edge. The tool edge, which varies in thickness, has unifacial use wear. The broken end scraper is made from a yellow-brown chert flake. Patterned unifacial flaking is present along one end of the flake. Due to the break, a portion of the tool edge is missing. The remaining tool edge displays evidence of unifacial use wear. This scraper may have broken during use.

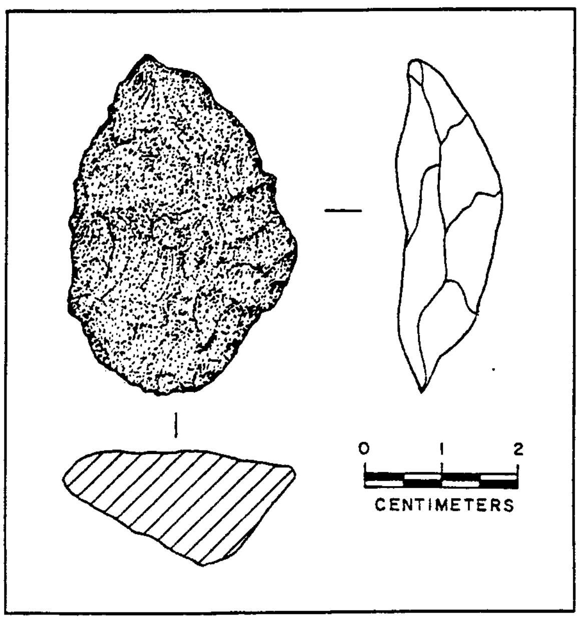


Figure 8.21. Scraper 5PE750.1j, FCMR.

The four unpatterned flake tools are retouched flakes. Three are chert flakes and one is a gray orthoquartzite flake. Two of the chert flakes have some cortex remaining. One of these is broken, and the rest are complete. Two of the chert flakes are bimarginally retouched and exhibit unimarginal use wear. The other two flakes have unimarginal retouching and no evidence of use wear.

The chopper is produced from a tabular piece of orthoquartzite. The tool edge is the only area of the artifact without cortex. Approximately seven flakes were unidirectionally removed to create the tool edge. There is evidence that the tool was utilized.

Four cores were identified on the surface, and one core fragment was recovered from Shovel Test 2. All but one are made from orthoquartzite. One chert core is multidirectional. Two of the other three cores are bidirectional, and the largest core is unidirectional.

A total of one hundred and seventy-two flakes was analyzed, with twenty-four recovered from the subsurface. The data from surface and subsurface are combined in the following discussion (Table 8.2). Locally obtained raw material types dominate the sample; orthoquartzite, chalcedony, and chert materials account for ninety-four percent of the sample. Simple flakes are the most common flake type, along with representative amounts of complex flakes and shatter, which occurred in nearly equal frequencies. The overwhelming majority (85%) of flakes display no cortex. Small (<½") flakes are easily the dominant flake size. Combined with the next larger size (<1"), they represent 92% percent of the assemblage.

The above characteristics are suggestive of late-stage reduction activities, which includes tool manufacture. The prevalence of generally smaller flakes, the comparatively significant number of complex flakes, and the small percentage of flakes with cortex support this conclusion. Interpretation using Sullivan and Rozen (1985) also suggests that tool manufacturing was taking place, based on the high number of flake fragments in combination with the number of broken flakes. There are also indications of core reduction, which is supported by the presence of a few cores. Although the samples are not equal, comparisons made on the attributes between subsurface and the surface flakes demonstrate comparable percentages.

Groundstone

A metate and a mano are present at the site, and the metate was recorded in the

Table 8.2. Surface and subsurface non-tool flaked-lithic debitage, 5PE750, FCMR.

Material	Quartzite/Orthoquartzite				Chert				Chalcedony				Silicified Wood			
Type	S	SS	Subtotal	%	S	SS	Subtotal	%	S	SS	Subtotal	%	S	SS	Subtotal	%
Size Grade																
>1"	11	1	**12**		2	0	**2**		1	0	**1**		0	0	**0**	
1/2" - 1"	17	1	**18**		9	0	**9**		4	0	**4**		3	0	**3**	
<1/2"	36	12	**48**		39	1	**40**		42	8	**50**		3	0	**3**	
Total	**64**	**14**	78	*40*	**50**	**1**	51	*26*	**47**	**8**	55	*28*	**6**	**0**	**6**	*3*
Flake Type (Ahler 1997)																
Shatter	8	1	**9**		12	0	**12**		14	2	**16**		2	0	**2**	
Simple	43	9	**52**		22	1	**23**		27	3	**30**		1	0	**1**	
Complex	13	4	**17**		16	0	**16**		6	3	**9**		3	0	**3**	
Bifacial Thinning	0	0	**0**		0	0	**0**		0	0	**0**		0	0	**0**	
Total	**64**	**14**	78	*40*	**50**	**1**	51	*26*	**47**	**8**	55	*28*	**6**	**0**	**6**	*3*
Cortex																
Present	11	1	**12**		6	0	**6**		6	2	**8**		2	0	**2**	
Absent	53	13	**66**		44	1	**45**		41	6	**47**		4	0	**4**	
Total	**64**	**14**	78	*40*	**50**	**1**	51	*26*	**47**	**8**	55	*28*	**6**	**0**	**6**	*3*
Flake Type (Sullivan and Rozen 1985)																
Complete	4	1	**5**		6	0	**6**		1	1	**2**		2	0	**2**	
Broken	14	2	**16**		8	0	**8**		5	3	**8**		0	0	**0**	
Flake Fragment	38	10	**48**		24	1	**25**		27	2	**29**		2	0	**2**	
Debris	8	1	**9**		12	0	**12**		14	2	**16**		2	0	**2**	
Total	**64**	**14**	78	*40*	**50**	**1**	51	*26*	**47**	**8**	55	*28*	**6**	**0**	**6**	*3*

S Surface
SS Subsurface

Table 8.2. Surface and subsurface non-tool flaked-lithic debitage, 5PE750, FCMR (cont).

Material	Quartz				Siltstone				Total	
Type	S	SS	Subtotal	%	S	SS	Subtotal	%	No.	%
Size Grade										
>1"	0	0	**0**		0	0	**0**		**15**	*7.7*
1/2" - 1"	0	0	**0**		1	1	**2**		**36**	*18.4*
<1/2"	4	0	**4**		0	0	**0**		**145**	*73.9*
Total	**4**	**0**	**4**	*2*	**1**	**1**	**2**	*1*	**196**	*100*
Flake Type (Ahler 1997)										
Shatter	1	0	**1**		0	0	**0**		**40**	*20.4*
Simple	3	0	**3**		1	1	**2**		**111**	*56.6*
Complex	0	0	**0**		0	0	**0**		**45**	*23*
Bifacial Thinning	0	0	**0**		0	0	**0**		**0**	*0*
Total	**4**	**0**	**4**	*2*	**1**	**1**	**2**	*1*	**196**	*100*
Cortex										
Present	0	0	**0**		0	1	**1**		**29**	*14.8*
Absent	4	0	**4**		1	0	**1**		**167**	*85.2*
Total	**4**	**0**	**4**	*2*	**1**	**1**	**2**	*1*	**196**	*100*
Flake Type (Sullivan and Rozen 1985)										
Complete	0	0	**0**		0	1	**1**		**16**	*8.2*
Broken	0	0	**0**		1	0	**1**		**33**	*16.8*
Flake Fragment	3	0	**3**		0	0	**0**		**107**	*54.6*
Debris	1	0	**1**		0	0	**0**		**40**	*20.4*
Total	**4**	**0**	**4**	*2*	**1**	**1**	**2**	*1*	**196**	*100*

S Surface
SS Subsurface

field. This sandstone metate is broken, but over half of the original artifact is still present. The specimen is a slab metate with moderate smoothing and some pecking.

One mano was located on the surface near a dense concentration of flaked-lithic artifacts. It is pecked from a fine- to medium-grained sandstone. The mano has two use surfaces. The motions characterized are reciprocal rocking for one use surface and reciprocal flat on the other use surface, where battering is present.

Summary and Conclusions

This site is an extensive scatter of flake-lithic artifacts and groundstone with nine associated stacked-stone features. The site was reevaluated twice by FLC, once in 1995 (Charles et al. 1997) and a second time in 1997 (Charles et al. (1999b). The main site area, originally mapped as 5PE750, consists of nine stacked-stone features, a light artifact scatter, two rock-art panels, and a large sink hole where rain and snowmelt collect. Systematic transects were undertaken to determine the horizontal extent of artifacts, thereby establishing the site boundary. A light but expansive scatter was followed over an area of eight acres, incorporating two previously identified sites, 5PE748 and 5PE749. While the three artifact scatters are discrete, artifacts spaced no more than 20 m apart connect the main scatters. Therefore, it was decided to include the entire scatter as a single site, map all the different loci, formal tools and features, and conduct subsurface testing in areas of artifact concentrations and sediment build-up.

Approximately 50% of the entire site exhibits exposed bedrock; therefore, subsurface testing was restricted to two areas of the site that held the best potential for subsurface deposits. Sixteen shovel tests and a single test unit were placed in the area previously identified as 5PE748, and nine shovel tests were excavated in the area of 5PE749. Results from subsurface testing failed to define either a buried cultural stratum or a paleosol. Artifacts were recovered from both the shovel tests and the test unit in the area of 5PE748, but were distributed unevenly from the present ground surface to a depth 25 cm below the surface, with no recognizable clustering or sediment change. The nine shovel tests in the area of 5PE749 failed to recover artifacts.

Subsurface testing at the site indicated that a shallow subsurface deposit is present in a concentration near the north end of the site. Eight of sixteen shovel tests in this area produced artifacts. Ten flakes and one core fragment were recovered from between 0 and 30 cm below the surface, and an additional flake was recovered from between 35 and 40 cm below the surface. None of the other shovel tests produced artifacts that deep. Test Unit 1 demonstrated that at least in this area of the site artifacts are no deeper than 20 cm below the ground surface and are found in Strata I and II and

in the very top of Stratum III. Artifacts are continuous from the surface to 20 cm, at which point they abruptly end. Thirteen flakes were recovered from the test unit; five of these were in the control sample. One of the five artifacts was smaller than ¼" and may have fallen through the conventional ¼" mesh. The final 19 to 24 cm of sediments in the test unit were culturally sterile.

The majority of surface artifacts occur within three main concentrations that are connected by a light scatter of artifacts that also connects the features. Locally procured raw materials supplied the raw materials for the majority of artifacts. While unmodified flakes are easily the dominant artifact type, there is diversity in the assemblage. Besides the unmodified flakes, projectile points, bifaces, scrapers, unpatterned flake tools, choppers, cores, and groundstone are present. Characteristics of the flake assemblage suggest that later stages of reduction and tool manufacturing were the primary activities at the site; however, some earlier stages of core reduction are apparent to a lesser degree. In spite of the large number and variety of artifacts, a buried cultural component was not defined in the areas tested.

The number and variety of artifacts from the site suggest that it was occupied for an extended period of time, either continuously or intermittently. Comparative analysis of the projectile points from the site indicates that it possesses both Late Archaic period and Developmental and/or Diversification period components. The lack of ceramics and the presence of architecture suggest that the site was most likely occupied during the Late Archaic or Developmental periods.

The site is determined eligible for nomination to the NRHP under Criterion D of 36CFR60; the potential to yield significant archaeological data. The site has standing architectural features that date to the Development or Diversifications periods. The presence of stacked-stone features allows us to conclude that the portion of the site originally recorded as 5PE750 is eligible for nomination to the NRHP; therefore, no subsurface tests were placed in the main site area. The features are mostly on bedrock, but with some potential for subsurface deposits in the interior; however, it was concluded that subsurface testing within the features was not necessary to determine their significance. The location is unique, and although there are architectural sites similar to 5PE750 on the FCMR, they are relatively rare and primarily confined to the Turkey Creek drainage. Several of the stacked-stone features at 5PE750 represent some of the best examples on the FCMR. Furthermore, it holds the potential to yield information on the research themes of chronology and cultural relationship, settlement patterns, the nature of prehistoric economies, horticulture, technology and material culture, and architecture as defined in the CRMP (Zier et al. 1997).

The areas away from the stacked-stone features did not produce evidence for buried artifacts or features. Therefore this portion of the site is not recommended eligible for nomination to the NRHP.

CHAPTER 9
5PE1610

Introduction

This small (166 m^2) prehistoric sheltered site was originally recorded in 1993 by CA (Zier et al. 1996). Three metates, two flakes, and a hammerstone/chopper were noted during the original inventory. A juniper branch in the rear wall of the shelter was noted as a possible cultural feature. The site was recommended as eligible for nomination to the NRHP because it had the potential to yield information on subsistence and chronology for the FCMR (Zier et al. 1996:248).

The site was revisited by FLC in 1997 (Charles et al. 1999b). Although artifacts, other than the metates, were not observed on the surface, a shovel test recovered a single chert flake and an unidentified bone fragment from between 0 and 30 cm below the surface. The charcoal in this shovel test was interpreted to represent a probable cultural stratum between 18 and 30 cm below the surface. Based on the probability of a buried cultural stratum, the site was determined to have the potential to yield significant *in situ* buried deposits. Diagnostic artifacts had not been recovered from this site, so the temporal affiliation was inconclusive. The site was recommended as eligible for nomination to the NRHP based on its potential to yield information on the research themes of the nature of prehistoric economies, settlement and subsistence, chronology and cultural relationships, and paleoclimates as identified in Zier et al. (1997). Management recommendations included avoidance and protection (Charles et al. 1999b:6.62-63).

The site is a moderately deep rock shelter on the upper slope of a steep arroyo on the west slope of Booth Mountain (Stone City U.S.G.S. 7.5' quadrangle [Figure 9.1]). The site was found along a sandstone escarpment. Surface artifacts are minimal and include six flakes, three complete metates, two metate fragments, and a chopper. The slope from the shelter to the northwest is between 0 ° and 25°(Figure 9.2). It is at an elevation of 6,300 ft (1,920 m) asl. Vegetation at the site consists of snowberry, juniper, skunkbush, and short grasses. The closest water source is an unnamed intermittent drainage 180 m from the site. Sediments consist of grayish brown sand and pebbles, which are mostly derived from roof spalls and granular disintegration of the conglomeritic sandstone bedrock. The site is in excellent condition with no evidence of military disturbance. As with all rock shelters in the area, packrat activity is ubiquitous.

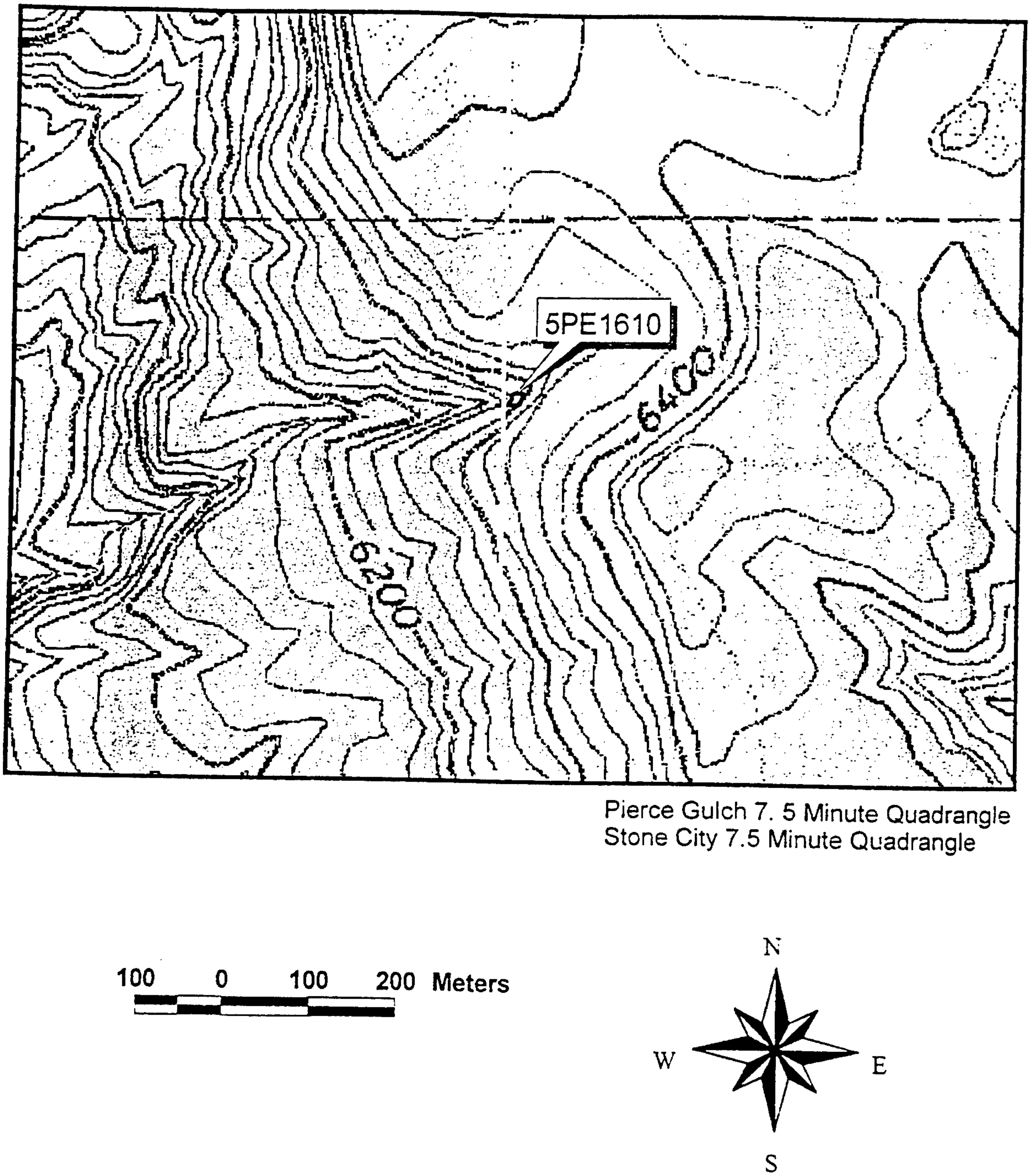


Figure 9.1. Location map, 5PE1610, FCMR.

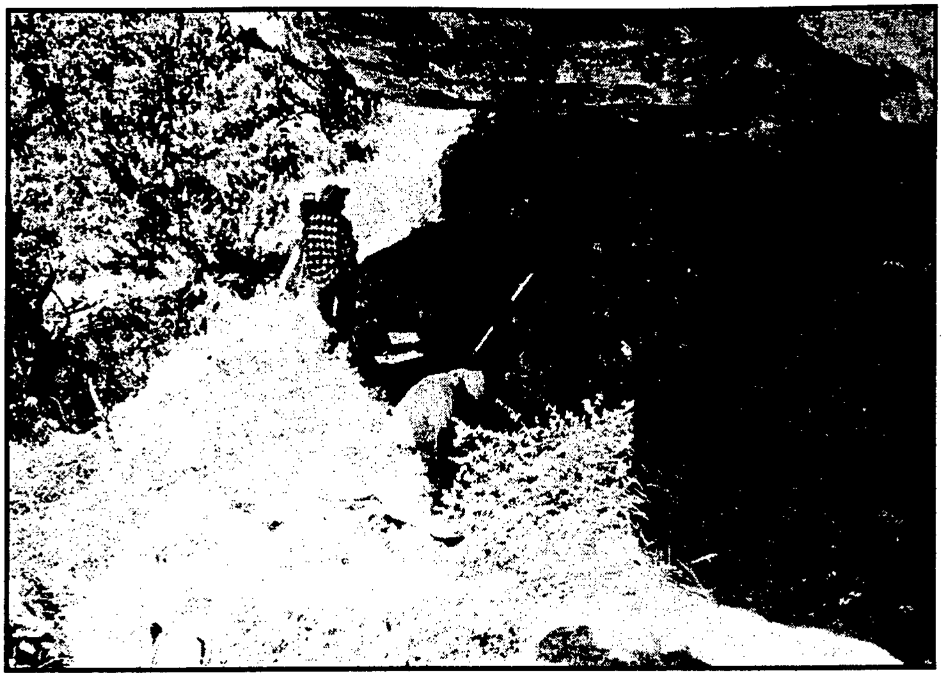


Figure 9.2. Overview of 5PE1610, FCMR. View is to the northeast.

Two previously unidentified small panels of linear grooves occur on two boulders adjacent to the shelter's back wall (Figure 9.3).

Surface Investigations

This small site was thoroughly inventoried for surface artifacts and features. Two metate fragments and six flakes were analyzed in the field. A single chopper was the only surface artifact collected. Three block metates had been documented previously. A site map was constructed with a Total Station of the shelter and the slope below (Figure 9.4). The shovel tests, the test unit, the grooved panels, and all surface artifacts were mapped.

Subsurface Investigations

Three shovel tests and a single test unit constituted the subsurface excavations.

Shovel Tests

Three shovel tests were placed in separate areas within the interior of the shelter. One shovel test was placed near the dripline in the center of the shelter, one was placed

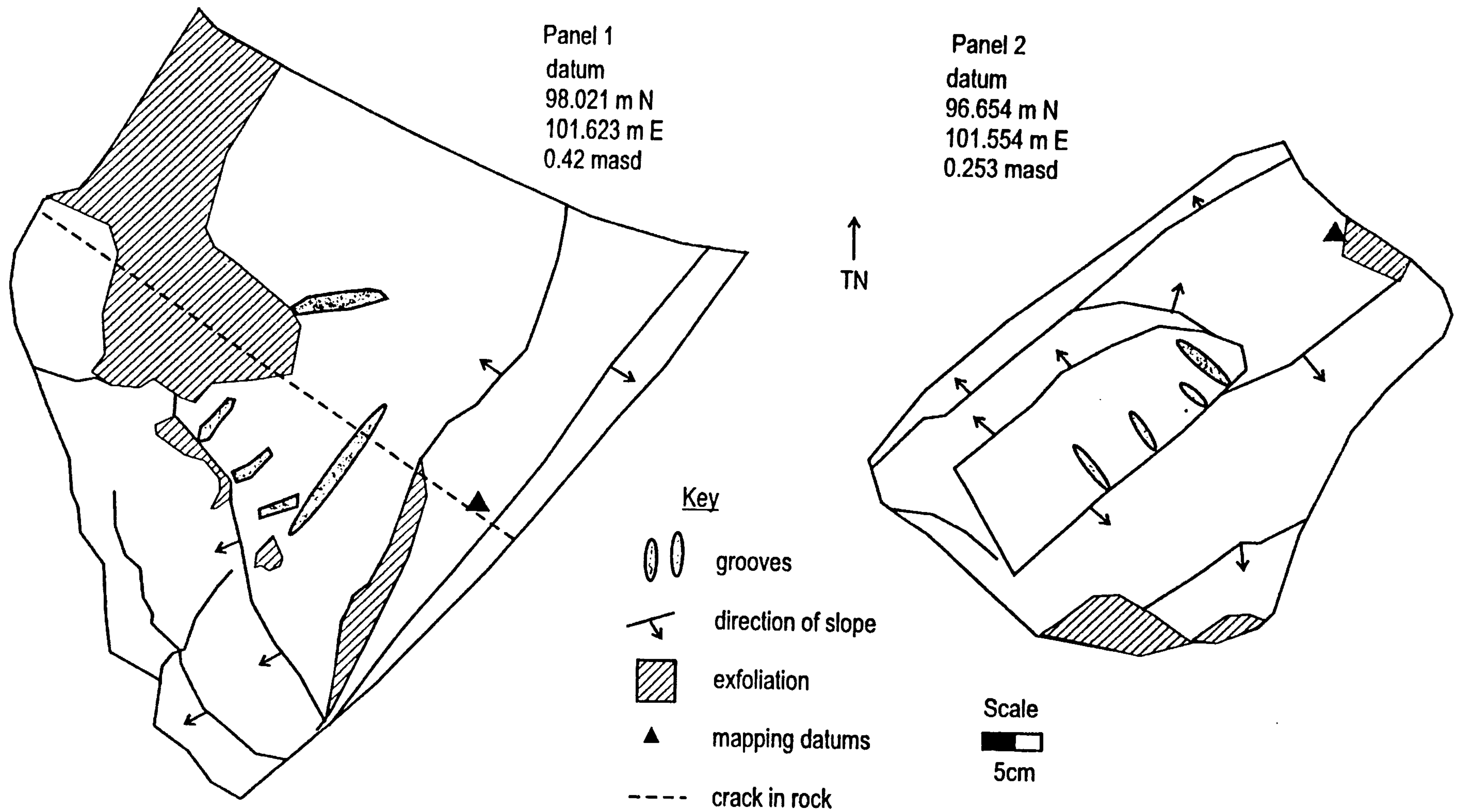


Figure 9.3. Planview of boulders with linear grooves, 5PE1610, FCMR.

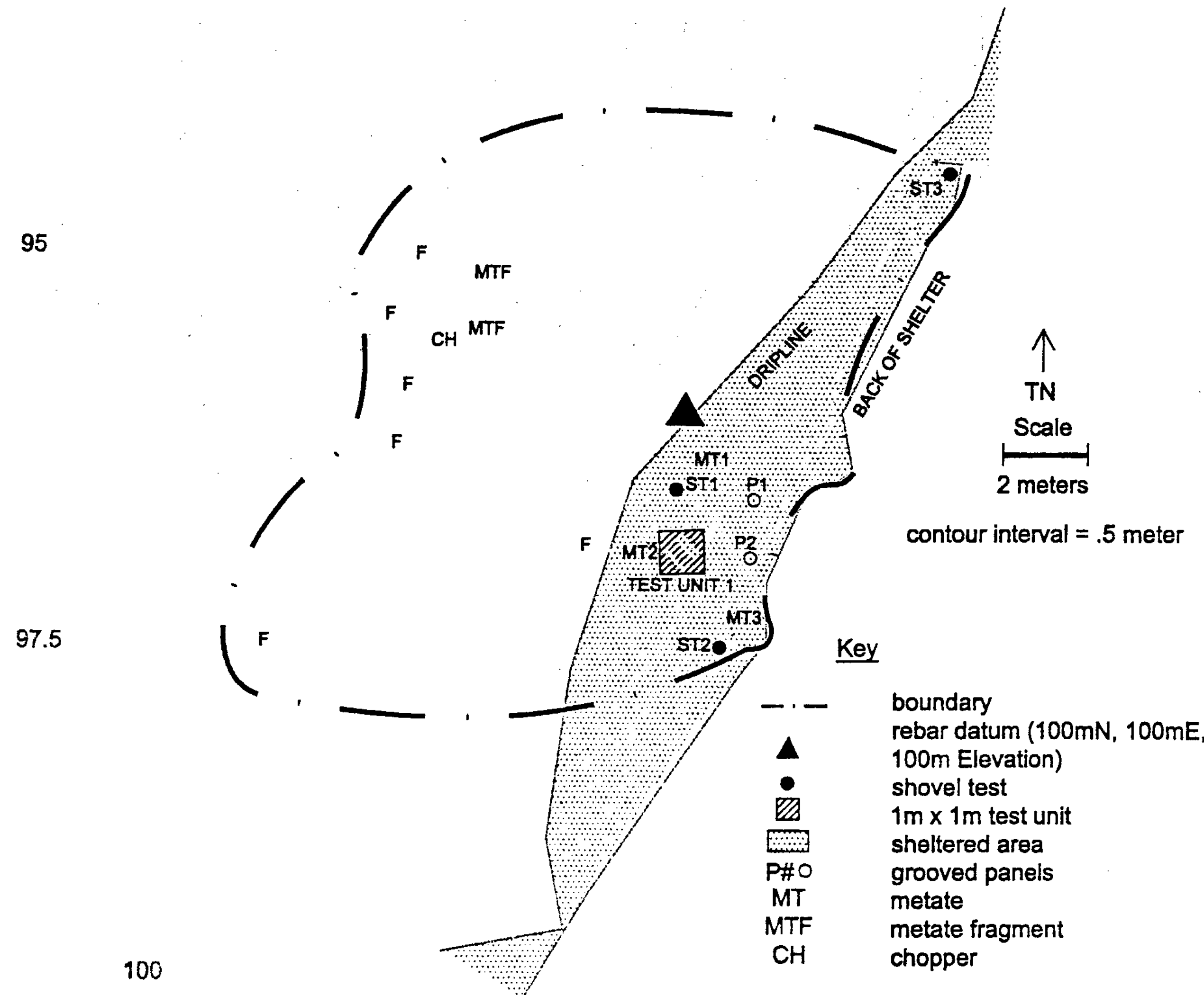


Figure 9.4. Site map, 5PE1610, FCMR.

along the back wall, and the other was placed at the north end of the shelter. The shovel tests were excavated to culturally sterile deposits, to bedrock, or to a point where the shovel tests could be no longer be excavated with the tools on hand (usually about 70 cm). There were no artifacts recovered from these shovel tests. Small mammal bone and rodent bone along with charcoal were recovered from two tests. Detailed stratigraphic descriptions of the shovel tests are provided in Appendix II.

Test Unit

A single test unit was excavated in this small sheltered site. Results from the test unit excavation are presented in Table 9.1.

Table 9.1. Test unit summary, 5PE1610, FCMR.

Test Unit No.	Layer	Level	Thickness Range (bgs)	Materials Recovered 1/4"	Flotation
1	1	1	4-9.5 cm	1 flaked-lithic artifact, 7 bone	snail, 64 bone, charcoal, seeds
1	1	2	0-3 cm	1 flaked-lithic artifact	snails, 25 bone, charcoal, seeds, 1 flaked-lithic artifact
1	2	*	7-10 cm	5 flaked-lithic artifacts, 1 bone, 1 ^{14}C sample[1]	charcoal, 25 bone, seeds, 14 flaked-lithic artifacts
1	3	*	8-9 cm	1 ^{14}C sample	charcoal, 1 bone, 3 flaked-lithic artifacts
1	4	*	11-25 cm	None	charcoal, snails, seeds
1	5	1	15-30 cm	None	No control sample

* Excavated as a single stratigraphic layer

Test Unit 1

This test unit was placed near the front of the shelter and in the widest portion. The unit was excavated to a total depth of 72 cm below the datum. The datum was established in the southwest corner at 96.26 mN, 99.46 mE, and 0.18 masd. The

[1]Radiocarbon date obtained.

control sample, however, was taken from the northeast corner. The unit was excavated into a massive piece of decomposing sandstone bedrock. It is unclear if this sandstone is bedrock or a large roof spall. Excavations were discontinued after excavating 15 to 30 cm within the decomposing sandstone.

The unit was excavated in five layers. Two levels were excavated in Layer 1, which consisted of loose sediments with numerous angular sandstone cobbles from roof fall. Three flakes were recovered from this 7- to 9.5-cm-thick layer. Numerous bones recovered from the layer are those of rodents. A layer change was made at the contact of the loose sandy sediments with a heavy charcoal-enriched layer, designated as Layer 2. Layer 2 ranged from 7 to 10 cm thick and contained artifacts, bone, and extensive charcoal. Several flat-lying stones possibly represent a portion of a cultural feature of unknown function. A radiocarbon sample was collected from this layer, which may represent a buried soil horizon as well as an ethnostratigraphic unit. The sample produced a calibrated 2–sigma radiocarbon age of 945 - 730 BP (Beta 140335), with calendar intercept dates of AD 1050, AD 1095, and AD 1140 (Appendix VII). Layer 3 was originally recorded as a feature because of the extensive charcoal encountered. However, it was later changed to a layer designation. This 8- to 9-cm layer was gray to black in color with sandstone cobbles and pebbles. A radiocarbon sample, artifacts, and one burned mammal bone were recovered from the layer. At the bottom of Layer 3, charcoal decreased drastically and sediments consisted of tan sand. No artifacts were recovered from Layer 4, which is the tan sand that ranged from 11 to15 cm thick. Layer 5, decomposing bedrock, was excavated 15 to 30 cm before excavation was terminated. This layer was excavated to explore the possibility of a deeper cultural deposit, below what may have been a roof spall. Although inconclusive, it is suggested that Layer 5 probably represents the bedrock formation as opposed to a piece of roof fall.

The north (south-facing) and the east (west-facing) wall profiles are illustrated in Figure 9.5. Five strata are identified in the profiles, and these are discussed below.

Stratum I — Stratum I is a light brownish gray (10YR 6/2) fine to medium sand. It has a granular to very weak angular blocky soil structure. The lower boundary is clear and smooth. Bioturbation is present in the form of packrat debris and rootlets. Poorly sorted pebbles from the conglomerate sandstone bedrock and angular sandstone account for less than 5% of the matrix. Charcoal and an occasional artifact are present in this layer of eolian silt and sand. There is a slight reaction to hydrochloric acid.

Stratum II — Stratum II is a very dark-brown (10YR 2/2) fine to medium sand with

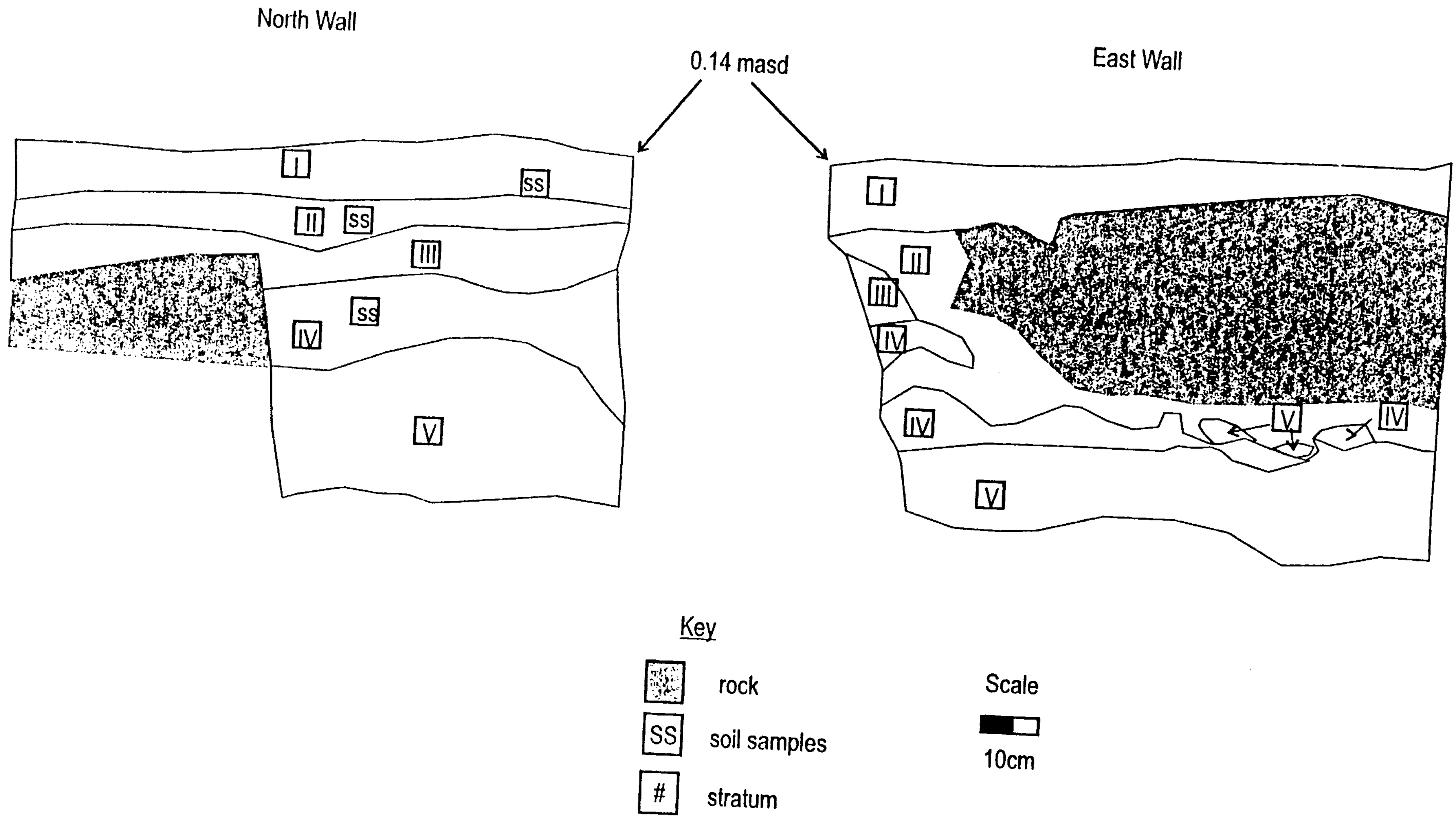


Figure 9.5. North-wall profile and east-wall profile, Test Unit 1, 5PE1610, FCMR.

a weak angular blocky soil structure. The lower boundary is clear and smooth. Bioturbation in the form of rootlets and packrat debris are scattered throughout the matrix, which contains charcoal and an occasional artifact. Less than 1% of the matrix is angular sandstone and quartzite pebbles. The sediments react violently to hydrochloric acid. This is a layer of lighter charcoal and ash overlying the thick charcoal-enriched layer identified as Stratum III.

Stratum III — Stratum III is a very dark-gray (10YR 3/1) fine to coarse sand. The soil structure is granular to weak angular blocky. The lower boundary is abrupt and undulating. Charcoal, artifacts, oxidation, unburned and burned wood, and fire-cracked rock occur in this ethnostratigraphic unit. Rootlets, packrat debris, and krotovina are obvious forms of bioturbation. The sediments react violently to hydrochloric acid. The charcoal increases in this stratum and becomes very dark with larger pieces. Quartzite pebbles from the conglomeritic lenses in the bedrock increase and account for about 5% of the matrix. A radiocarbon sample from this stratum was collected and processed.

Stratum IV — Stratum IV is a yellowish brown (10YR 5/4) sandy loam to loamy sand. The soil structure is angular blocky and moderately formed. The lower boundary is very abrupt and undulating. Bioturbation includes unburned wood fragments, root and worm pores, packrat debris, and krotovina. Conglomeritic pebbles decrease, and angular sandstone accounts for less than 1% of the matrix. Carbonate films are present in the stratum, which reacts moderately to hydrochloric acid. This layer was encountered directly below the cultural layer. It is composed primarily of disintegrated sandstone, perhaps granular disintegration from the shelter's roof mixed with some eolian and colluvial sediments. It is highly mottled. It represents a buried soil (Ab) horizon, which indicates a stable surface prior to cultural habitation.

Stratum V — Stratum IV is a light gray (5Y 7/1) to reddish yellow (7.5YR 6/8) medium sand with silt. The lower boundary is concealed. There is a slight reaction to hydrochloric acid. This stratum is solid weathered conglomeritic sandstone, which may be weathered bedrock, but this is inconclusive. The weathered conglomeritic sandstone, which breaks into platy pieces, is multi-colored with some caliche and possesses bedding, but differs in both color and texture from the exposed bedrock in the main alcove.

Material Culture

A total of 37 artifacts comprises the artifact assemblage. Twelve of the total were found on the surface; these include six flakes, three metates, two metate fragments, and a chopper. Twenty-five flakes were recovered from the test unit. The surface flakes and the metate fragments were analyzed in the field and left, while the chopper was collected for later examination. Quantitative information for the chopper is provided in Appendix III and information on the metates is provided in Appendix IV.

Flaked-lithic artifacts

The chopper is made from a piece of tabular orthoquartzite and displays unimarginal retouching as well as unimarginal use wear. The modified edge is on the naturally pointed edge of the tabular stone. This expedient tool represents the only non-groundstone tool documented at the site.

Data collected on the non-tool flaked-lithic assemblage provide the basis for some general interpretations about lithic production at the site. Data from the surface and subsurface are combined for this discussion (Table 9.2). Locally derived raw materials were used extensively at the site, with chert and quartzite accounting for the majority of the assemblage. Simple flakes are easily the most prevalent flake type. Other tendencies include a predominance of smaller flakes and a high number of flakes without cortex.

Together, these characteristics suggest that late-stage reduction activities, which includes tool manufacture, were most prevalent at this location. The paucity of complex flakes supports this interpretation. The limited number of flakes with cortex implies that earlier stages of reduction may have occurred elsewhere. The generally smaller flake size is also indicative of late-stage reduction. Applying Sullivan and Rozen's (1985) categories, interpretations are basically the same: core reduction was slightly more common than tool manufacture. However, the relatively high percentage of flake fragments coupled with the number of broken flakes suggest that tool production activities occurred almost as frequently.

Three shovel tests failed to recover any lithic material, but two of the tests indicated significant sediment deposition. Shovel Test 2 recovered small mammal bones and a charcoal sample from 40+ cm below the ground surface.

Excavations in Test Unit 1 exposed a buried cultural horizon. The initial eolian

Table 9.2. Surface and subsurface non-tool flaked-lithic debitage, 5PE1610, FCMR.

Material	Quartzite/Orthoquartzite				Chert				Chalcedony				Quartz				Total	
Type	S	SS	Subtotal	%	S	SS	Subtotal	%	S	SS	Subtotal	%	S	SS	Subtotal	%	No.	%
Size Grade																		
>1"	4	1	5		0	0	0		0	0	0		0	0	0		5	16.1
1/2" - 1"	1	2	3		1	0	1		0	1	1		0	0	0		5	16.1
<1/2"	0	2	2		0	16	16		0	2	2		0	1	1		21	67.8
Total	5	5	10	32.3	1	16	17	54.8	0	3	3	9.7	0	1	1	3.2	31	100
Flake Type (Ahler 1997)																		
Shatter	1	0	1		0	5	5		0	0	0		0	0	0		6	19.4
Simple	3	3	6		1	10	11		0	2	2		0	0	0		19	61.2
Complex	1	2	3		0	1	1		0	1	1		0	1	1		6	19.4
Bifacial Thinning	0	0	0		0	0	0		0	0	0		0	0	0		0	0
Total	5	5	10	32.3	1	16	17	54.8	0	3	3	9.7	0	1	1	3.2	31	100
Cortex																		
Present	2	1	3		1	1	2		0	0	0		0	0	0		5	16.1
Absent	3	4	7		0	15	15		0	3	3		0	1	1		26	83.9
Total	5	5	10	32.3	1	16	17	54.8	0	3	3	9.7	0	1	1	3.2	31	100
Flake Type (Sullivan and Rozen 1985)																		
Complete	2	4	6		1	4	5		0	0	0		0	0	0		11	35.5
Broken	2	1	3		0	1	1		0	1	1		0	0	0		5	16.1
Flake Fragment	0	0	0		0	6	6		0	2	2		0	1	1		9	29
Debris	1	0	1		0	5	5		0	0	0		0	0	0		6	19.4
Total	5	5	10	32.3	1	16	17	54.8	0	3	3	9.7	0	1	1	3.2	31	100

S Surface
SS Subsurface

stratum contained a few artifacts along with organic and packrat debris. As the depth increased, the number of artifacts and the amount of charcoal increased as well. The artifact count rose near the transition from Stratum II to Stratum III, which is perceived as a cultural layer. The upper half of Stratum III contained the largest number of artifacts, but by the base of Stratum III charcoal mottling and cultural material ceased. Over twenty flakes and several charcoal samples were recovered from this buried horizon. Eighteen of the twenty-five flakes collected from subsurface testing were found in the control samples in Test Unit 1. Twelve of the eighteen flakes could have fallen through the conventional ¼" mesh. As noted earlier, small flakes are present in larger quantities. Examination of the control sample artifacts indicates that some of the flakes are quite small, supporting the previous interpretation that tool production was an important activity at the site. The presence of small debitage in the control samples indicates that smaller flake types, such as thinning or resharpening flakes, occur at the site.

Groundstone

The two metate fragments fit together and constitute less than half of a sandstone slab metate. There is evidence of grinding and pecking on one side of this metate. The three previously recorded metates are also made of sandstone. These are typed as block metates. One metate possesses a shallow basin, while the other two are flat.

Fauna

A total of 136 bone fragments was recovered (Appendix V) from subsurface testing. Ten belong to unidentifiable mammal and were found in Shovel Test 2. One burned mammal bone was found in Test Unit 1, Level 1/Layer 3. All others are assigned to *Rodentia*. One rodent long-bone shaft from Test Unit 1, Level 1/Layer 2 was modified into a needle/awl.

Macrobotanical

Three samples were submitted for macrobotanical analysis. These samples include the entire light fraction from three control samples. The results of macrobotanical analysis are presented in Appendix VI.

Summary and Conclusions

The small number of artifacts in the assemblage limits the interpretations that can

be made about the site. Interpretations, based on the flaked-lithic assemblage, suggest that a variety of lithic reduction activities took place under the protection of the shelter and included later stages of reduction and tool production. The presence of metates implies that food processing was carried out here as well. Excavation of the single test unit clearly establishes the presence of a buried cultural horizon. The site is therefore recommended as eligible for nomination to the NRHP under Criterion D; the potential to yield significant information. These preliminary investigations, despite the small number of artifacts and the absence of temporally diagnostic artifacts at the site, indicate that there is potential for further information. The processed charcoal sample suggests a possible occupation during the Diversification period. The site also has the potential to yield information on the research themes of chronology and cultural relationships, settlement patterns, the nature of prehistoric economies, horticulture, paleoclimates, technology and material culture, and geomorphology as defined in the CRMP (Zier et al. 1997).

CHAPTER 10
5PE1785

Introduction

The site is a relatively large (2,502 m^2), open prehistoric site lacking features. It was recorded by FLC in 1995 (Charles et al. 1997:6.13-15). Artifacts consisted of lithic-flaking debris of orthquartzite, chert, and chalcedony, and two pieces of groundstone, a mano and a fragment of a piece of groundstone, possibly a piece of a metate. The initial inventory estimated that between 75 and 100 surface artifacts were present at the site. A sample of artifacts was field analyzed in a 1-x-16-m transect through a portion of the site. From this limited sample, it was concluded that flaking activities at the site included lithic tool manufacture and intensive core reduction.

Temporally diagnostic artifacts were not present in the surface artifact assemblage, but the abundance of non-tool debitage, along with a sandstone mano and a fragment of ground sandstone, suggested that other artifacts may lie buried. Groundstone indicated food processing and preparation, and its presence suggested the potential for buried features. The site was recommended as eligible for nomination to the NRHP because of its potential to yield information important to the prehistory of the FCMR as defined by Zier et al. (1987 [prehistoric settlement patterns and economics]) and to the general research domains outlined by Eighmy (1984) for the Colorado Plains. Specifically, the site could contribute to an understanding of resource exploitation and procurement within the Plains/Mountain transition.

The site is located on the west slope of Booth Mountain (Pierce Gulch U.S.G.S. 7.5' quadrangle [Figure 10.1]). The site is at an elevation of 5,935 ft (1,809m) asl. It is in a small saddle at the southern end of a north–south trending ridge. The eastern site boundary extends just beyond the tree line into an open meadow. The western boundary is near the position where the sandstone bedrock begins to surface before descending west to the valley below (Figure 10.2). A massive outcrop of Dakota Sandstone forms the northern boundary, and this eroding bedrock supplies the parent material to the site. The site is under a fairly dense ground cover of grasses, wild flowers, sage, cacti, mountain mahogany, and scattered pinyon and juniper trees. The woods become more dense to the west along the sandstone slopes. Aspect from the site is to the east and west. From the site, there is a clear vista of Booth and Pierce Gulches to the west. The nearest water source is an intermittent drainage 300 m to the south. Disturbance to the site is slight and consists mainly of colluvial and eolian processes and bioturbation. The majority of artifacts are exposed between patches of

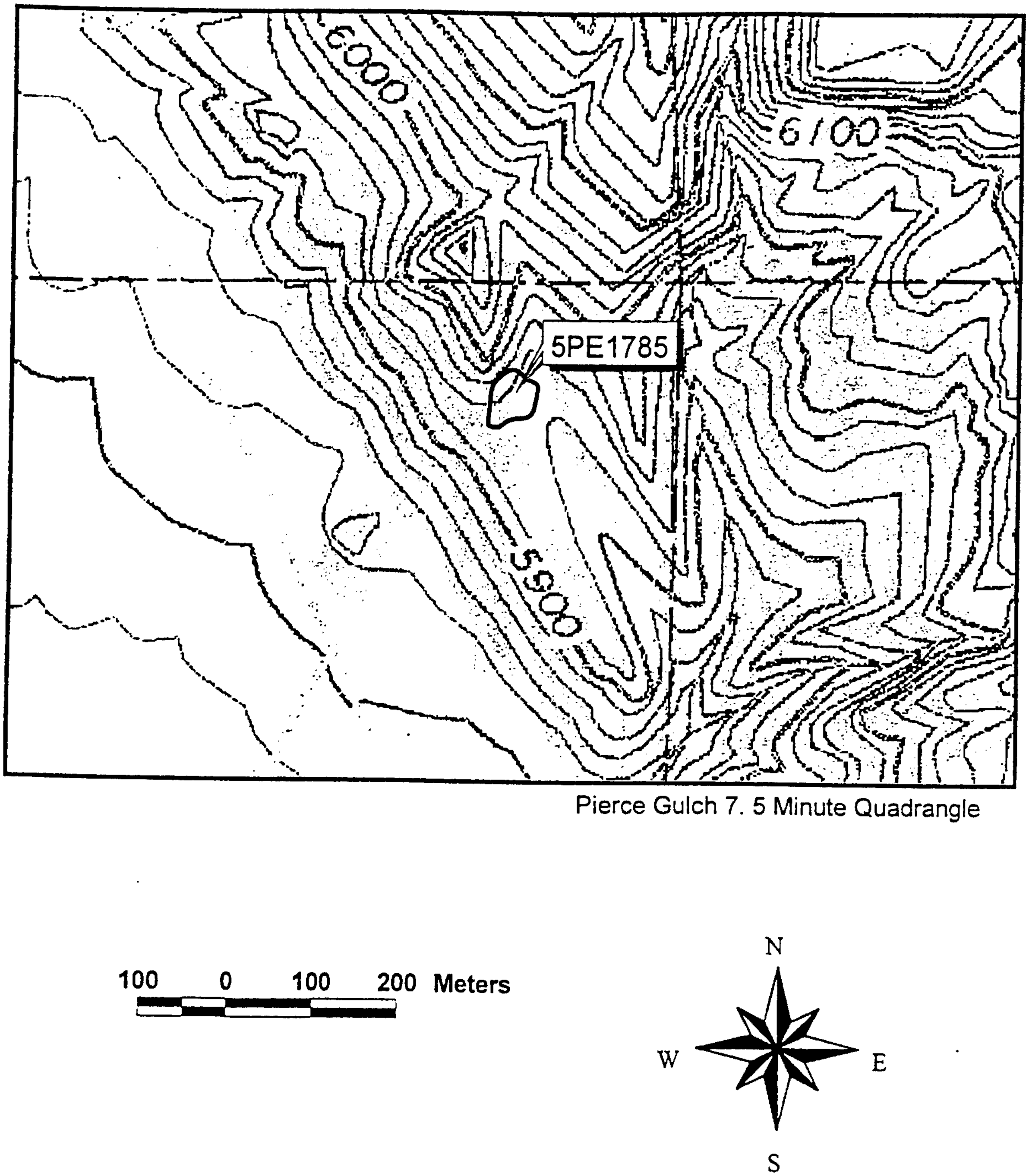


Figure 10.1. Location map, 5PE1785, FCMR.

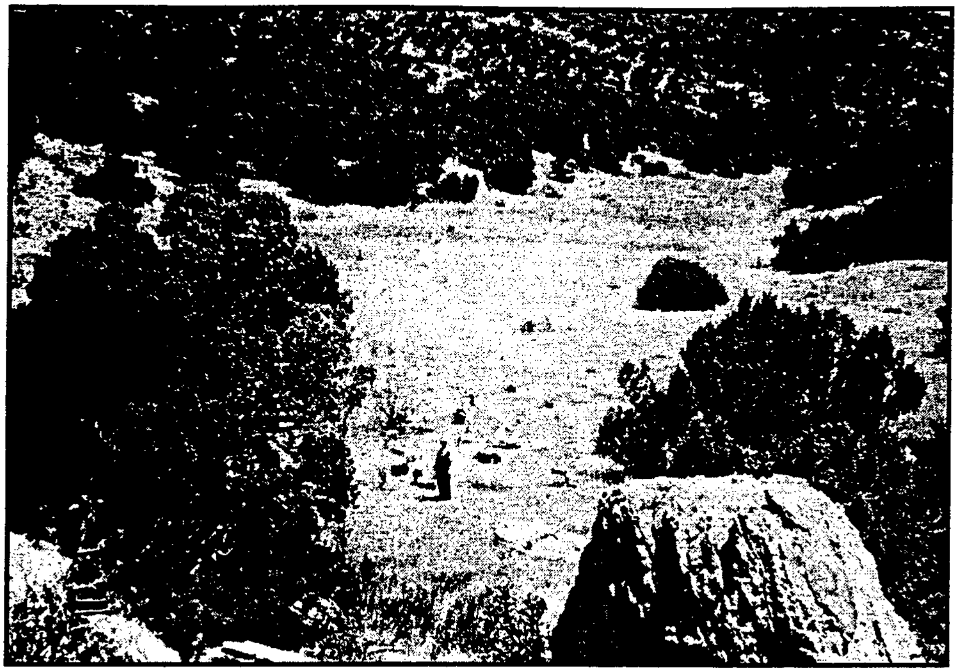


Figure 10.2. Site overview, 5PE1785, FCMR. View is to the southeast.

grass. Some light military disturbance is present in the vicinity of the site but not within the site boundary.

Surface Investigations

The 1999 surface investigations began by flagging all artifact concentrations, tools (flaked- and ground-stone) and the site boundary. Although artifacts are dispersed across the site, most of the artifacts are clustered in three concentrations. A sample of one hundred and sixty-one flakes and three cores was analyzed in the field along with a metate fragment. Artifacts collected for further analysis include one chopper, two utilized flakes, three retouched flake, six bifaces, and a hammerstone. Once the site boundary had been determined, a site map was constructed using the Total Station (Figure 10.3).

Subsurface Investigations

Twenty-nine shovel tests and two test units were excavated at this site.

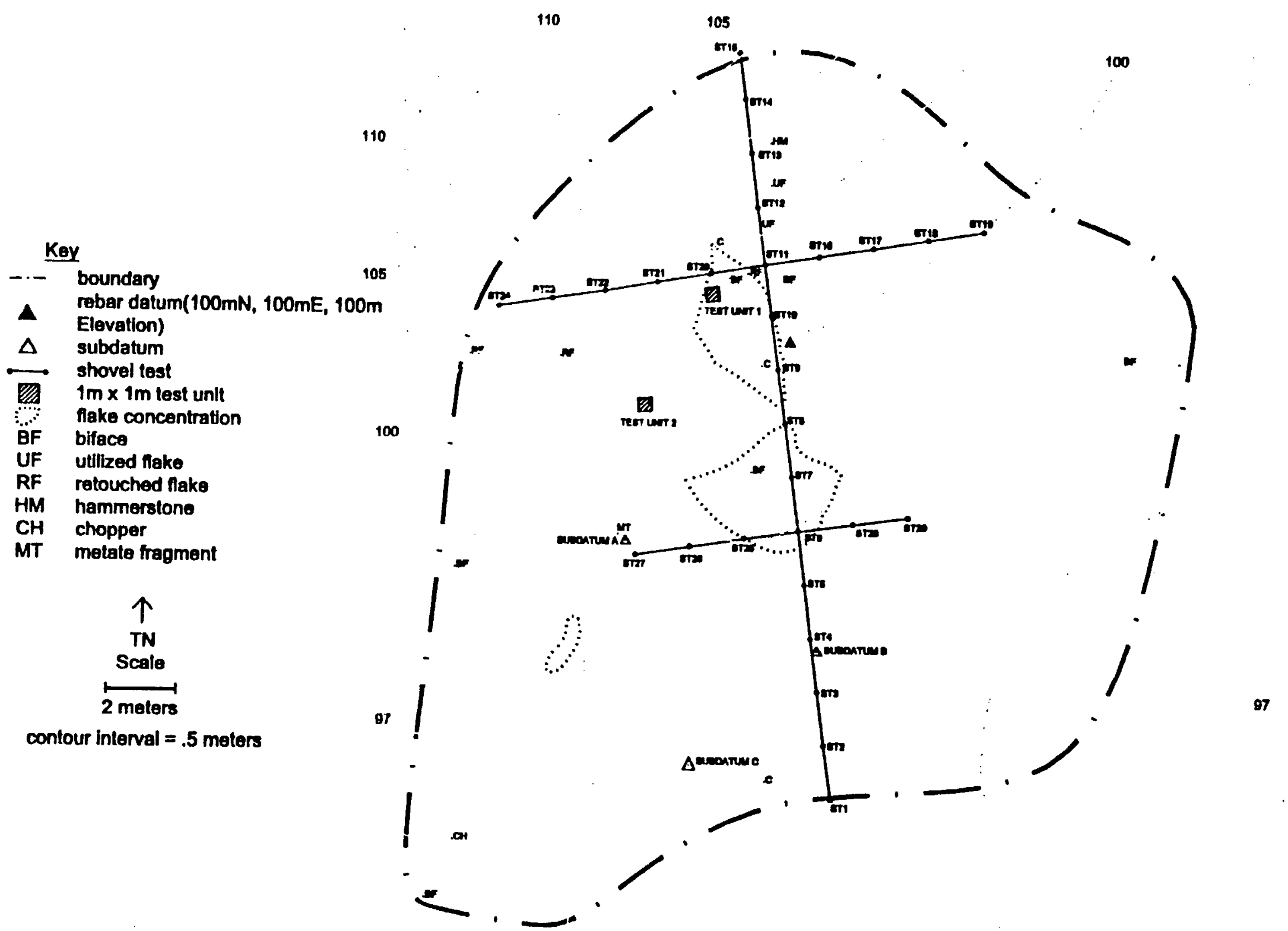


Figure 10.3. Site map, 5PE1785, FCMR.

Shovel Tests

Three lines of shovel tests were excavated at the site. The longest line was oriented north– south, and two smaller lines were placed perpendicular to the long line and intersected at Shovel Test 6 and Shovel Test 11. Shovel tests were placed every four meters apart. They were excavated to culturally sterile deposits, to bedrock, or to a point where it became impossible to continue excavation with the available tools (usually about 70 cm). Ten (34%) of the total 29 shovel tests recovered artifacts. The first shovel test line was placed near the middle of the site and was oriented in a north–south direction parallel with the site's long axis. Fifteen shovel tests were excavated along this line, and six of these recovered artifacts. A second line was placed perpendicular to the first and in the northern portion of the site. Nine shovel tests were excavated along this line, four of which produced artifacts. A third shovel test line was placed near the middle of the site and south of the main artifact concentration, again perpendicular to the first line. Five shovel tests were excavated along this line, and none produced artifacts.

From the shovel test results, it was determined that buried artifacts were present at the site to varying depths. However, no buried cultural horizon was identified in these shovel tests. The distribution of subsurface artifacts from the shovel tests mirrors the surface artifact distribution. Detailed stratigraphic descriptions of the shovel tests are presented in Appendix II.

Test Units

Two test units were excavated at this site. One test unit (Test Unit 1) was placed in a concentration of flaked-lithic artifacts near the north-central portion of the site. The other test unit (Test Unit 2) was placed near the western site boundary in an area where sediment deposition was believed to be great enough to conceal buried cultural deposits. Test unit results are summarized in Table 10.1.

Test Unit 1

Test Unit 1 was excavated in four layers to a total depth of between 31.5 and 43.5 cm below the ground surface. The datum and the control sample were set in the northeast corner (104.1 mN, 94.74 mE, 0.63 masd). The test unit was on a slope. Level 1/Layer 1 was the sod layer. The hummocks of the sod (which ranged from between 0 cm and 4 cm thick) were removed first. Flakes were found along with numerous small, flat angular sandstone. Layer 2 was excavated in two levels. Due to the slope, Level 2 was removed only from the south half of the unit. Level 1/Layer 2 1 was between 0 and 10 cm thick. This level contained a few flakes and small, flat,

angular to subangular sandstone. Some cobble-size rocks were present as well. A layer change was designated between 7 and 13.5 cm below the ground surface when sediments changed to a lighter color and the sandstone rocks diminished. Layer 3 was excavated in two levels to a total depth between 20 and 30.5 cm below the ground surface. This layer was a lighter color with some flat, angular sandstone pebbles and a few cobbles. No artifacts were recovered from this layer. A layer change to Layer 4 was initiated when the matrix became dominated by a grayish clay loam, which became compact and broke into subangular blocky peds. Excavations were terminated when it was conclusively established that no artifacts were present in the layer.

Table 10.1. Test unit summaries, 5PE1785, FCMR.

Test Unit No.	Layer	Level	Depth Range (bgs)	Materials Recovered 1/4"	1/16" Control
1	1	*	0-1 cm	4 flaked-lithic artifacts	No control sample
1	2	1	0-10 cm	3 flaked-lithic artifacts	3 flaked-lithic artifacts
1	2	2	0-10.5 cm	3 flaked-lithic artifacts	1 flaked-lithic artifact
1	3	1	0-10 cm	None	None
1	3	2	7-13 cm	None	None
1	4	1	8-16 cm	None	None
2	1	*	2-6 cm	None	No control sample
2	2	*	3-10 cm	3 flaked-lithic artifacts, 1 utilized flake	None
2	3	1	10 cm	2 flaked-lithic artifacts	1 flaked-lithic artifact
2	3	2	10 cm	None	2 flaked-lithic artifacts

* Excavated as a single stratigraphic layer.

Four strata were identified in the north (south-facing) and east (west-facing) wall profiles of the unit. The four strata are illustrated in Figure 10.4., and they are described below.

Stratum I Stratum I is a light grayish brown (10YR 6/2) sandy loam. The soil structure is very weak and subangular blocky. The lower boundary is clear and smooth. Natural additions include roots, gravels, and a small amount of calcium carbonate (the sediments reacted slightly to

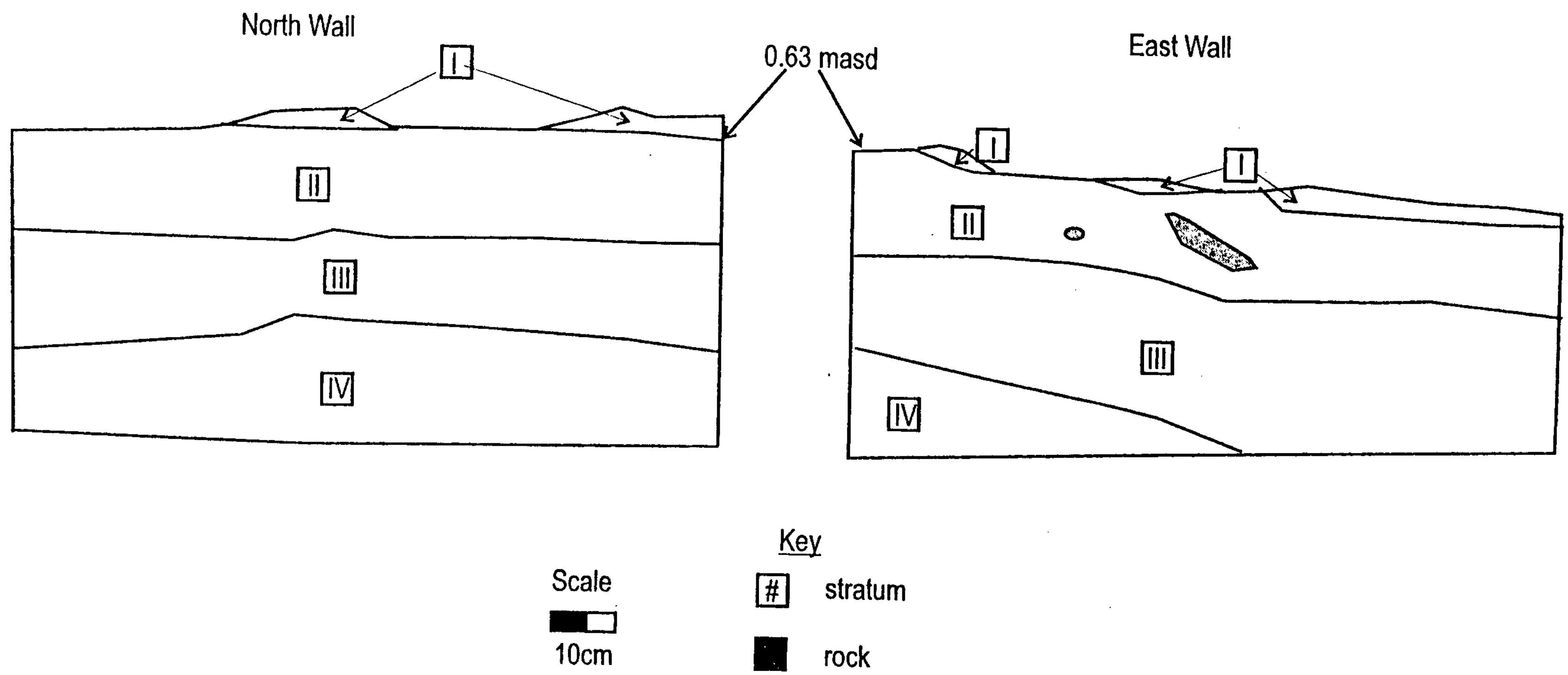


Figure 10.4. North-wall profile and east-wall profile, Test Unit 1, 5PE1785, FCMR.

hydrochloric acid). Sandstone gravels range from coarse sand to pebbles and account for between 5% and10% of the matrix. Artifacts were found in this sod layer.

Stratum II — Stratum II is a dark grayish brown (10YR 4/2) fine sandy loam. The peds are weak and subangular blocky. The lower boundary is clear and wavy. Roots, gravels (5% to 10%), and cobbles are present in the stratum. The sediments reacted moderately to strongly to hydrochloric acid. Artifacts were found in the stratum.

Stratum III — Stratum III is an olive-brown (2.5YR 4/3) sandy loam. The soil structure is weak and subangular blocky. The lower boundary is clear and undulating. There is a strong reaction to hydrochloric acid, indicating a possible Bk soil horizon. There are few roots and no artifacts in the stratum. Estimated gravel is between 10% and 20%. Sandstone gravels range in size from coarse sand to pebble.

Stratum IV — Stratum IV is a light brownish gray (2.5YR 6/2) clay loam. The soil structure is well developed and subangular blocky. The lower boundary remains concealed. The sediments react very strongly to hydrochloric acid. Natural additions include clay and a few roots. Gravels decrease to 1% of the matrix. This stratum may represent a C soil horizon. There are no artifacts in the stratum.

Test Unit 2

Test Unit 2 was excavated near the western boundary of the site to determine the potential for buried cultural deposits in an area believed to have undisturbed sediments. The unit was excavated in three layers. The datum was placed in the northwest corner (95.94 mN, 88.86 mE, 0.20 mbsd), and the control unit was excavated from the same corner. The final maximum depth of the unit was between 26 to 36 cm below the ground surface. Layer 1, the sod layer, ended between 2 and 6 cm below the ground surface. Artifacts were not encountered in the layer, which was characteristically similar to the underlying layer, Layer 2. Layer 2 was excavated as a single layer that ranged from 3 to 10 cm thick. Layer 2 was similar to Layer 1, but with an increase in cobbles and artifacts. Three flakes and one utilized flake were recovered from the layer. The frequency of grass roots continued in the layer. A layer change to Layer 3 was initiated because of a higher clay content, a lighter sediment color, and an increase in calcium carbonate and gravels. Larger roots were present in the layer, but the grass roots decreased. Layer 3 was excavated in two levels. A few flakes were recovered from the top few centimeters of Level 1/Layer 3. In Level 2/Layer 3, clay increased while the gravel remained fairly consistent with Level 1/ Layer 3. Large roots continued in the layer, but the frequency of smaller roots continued to diminish. Artifacts were not recovered from this layer while in the field. The unit was terminated when over 15 cm

of excavation failed to produce any artifacts or cultural deposits.

Three strata were identified in the west (east-facing) and the north (south-facing) wall profiles. These strata are illustrated in Figure 10.5, and they are described below.

Stratum I — Stratum I is a very dark-brown (10YR 2/2) sandy silt loam. It is 3 to 5 cm thick. Pedogenic structure is subangular blocky and weakly developed. The lower boundary is diffuse and undulating. The sediments are matrix supported and the gravels are well sorted. Gravels account for less than 1%. There is some bioturbation from roots. There are no artifacts in this stratum, and the sediments do not react to hydrochloric acid.

Stratum II — Stratum II is a very dark brown (10YR 2/2) sandy loam with small amounts of silt and clay. Stratum thickness ranges from 5 to 30 cm. The structure is subangular blocky and moderately developed. The lower boundary is clear and wavy. The sediments are matrix-supported—gravels account for less than 1% of the matrix—and are well sorted. The gravels increase slightly from the above stratum. There is some mottling, with an increase in clay. Sand, although still present, is less consistent than in Stratum I. Bioturbation is present in the form of roots. Artifacts are present in the stratum. There is no reaction to hydrochloric acid.

Stratum III — Stratum III is a brown (10YR 5/3) sandy loam with some silt. The structure is angular blocky and well developed. The lower boundary remains concealed. The sediments are matrix-supported with little sand and a higher percentage of silt and clay. Gravels increase slightly to between 1% and 3%. Sediments react slightly to hydrochloric acid. Artifacts were found only in the bioturbated control sample in this stratum.

Material Culture

A total of 220 artifacts is included in this analysis. This total consists of 178 surface artifacts and 42 subsurface artifacts. The surface assemblage includes 161 non-tool flaked-lithic artifacts and 17 tools (5 bifaces, 5 unpatterned flake tools, 3 cores, 1 chopper, 1 metate, and 1 hammerstone). The flakes, the metate, and the cores were analyzed in the field and were left. This total represents a sample of the surface flakes. Approximately 100 flakes were not analyzed. The subsurface assemblage is comprised of 35 flakes, 5 unpatterned flake tools, and 2 bifaces. Quantitative information on the

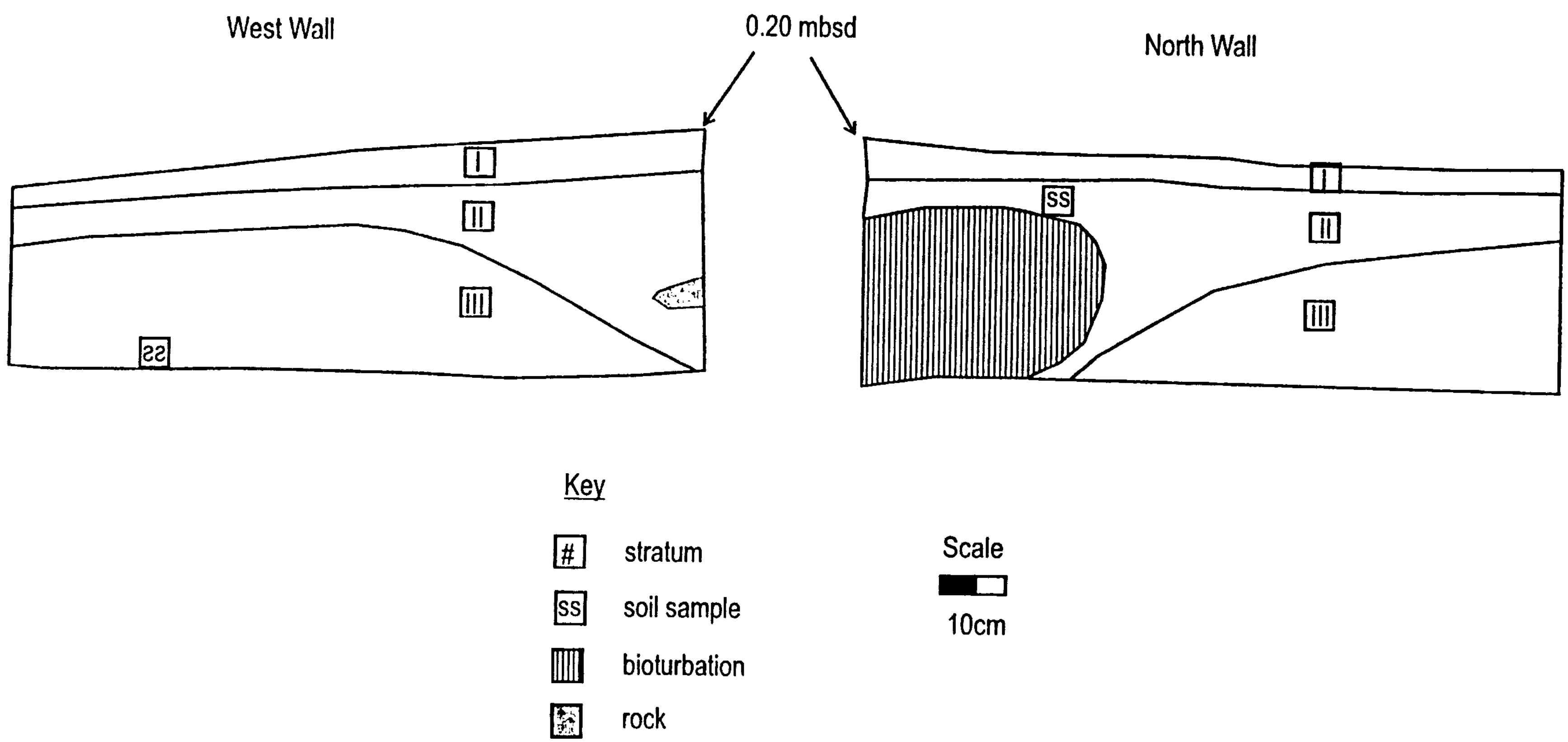


Figure 10.5. West-wall profile and north-wall profile, Test Unit 2, 5PE1785, FCMR.

flaked-lithic tools and cores is presented in Appendix III. Information on the groundstone fragment is provided in Appendix IV.

Flaked-lithic artifacts

Eight bifaces are present in this assemblage; six are from the surface and two are from the subsurface. The two subsurface specimens were found in the first 5 cm of two shovel tests (19 and 20). Three of the bifaces are complete. All three are oval and are classified as large, unfinished, patterned bifaces. Two are manufactured from chert and the other is manufactured from orthoquartzite. All three complete bifaces show evidence of edge utilization, which suggests that they were marginally used despite being unfinished. Thinning is more extensive on one of the chert bifaces. This artifact (5PE1785.21a) is illustrated (Figure 10.6) because it represents a good example of a thick oval biface, which is common from sites at the FCMR. The other two bifaces are in the initial stages of manufacture. The remaining five broken bifaces (three chert, one chalcedony, and one orthoquartzite) are smaller than ½". Three are biface tips, one is the proximal end of a biface, and the last is too small for further classification. All bifaces are manufactured from locally derived raw materials.

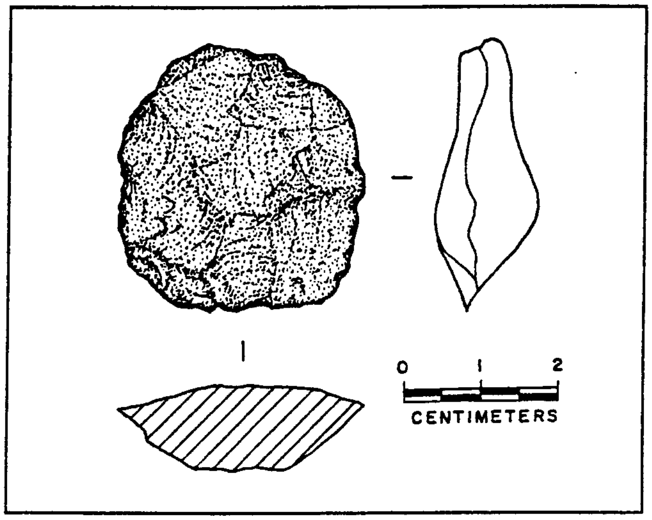


Figure 10.6. Biface, 5PE1785.21a, FCMR.

Ten unpatterned flake tools are present in the assemblage; six artifacts are utilized flakes and four are retouched flakes. Four utilized flakes and one retouched flake were recovered from subsurface contexts between 0 and 20 cm below the ground surface. Two utilized and three retouched flakes were collected from the surface. Raw material types include chert, chalcedony, orthoquartzite, silicified wood, and limestone. Four of the six utilized flakes are broken flakes. Two of these broken flakes exhibit bimarginal use wear, and the other two utilized flakes possess only unimarginal flaking. The two unbroken utilized flakes have unimarginal use wear. Three of the retouched flakes show unimarginal use wear, and the other possesses bimarginal use wear. Three of the four retouched flakes have bimarginal retouching, while the fourth is retouched on one side. The utilized edge on all four broken utilized flakes and the modified edges on the two

broken retouched flakes extend to the break, suggesting that these tools may have been broken during use.

One quartzite chopper was collected from the surface. Three unimarginal retouched flakes are removed from the sharp margin of a broken piece of tabular rock. There is no evidence of use wear. The hammerstone is a waterworn pebble with battering along one broken edge. Approximately one-third of the pebble remains, and it may have broken during use. Three cores were analyzed during the surface reconnaissance. The cores include one unidirectional orthoquartzite core, one multidirectional orthoquartzite core, and one multidirectional silicified wood core.

The non-tool flaked-lithic assemblage includes 161 surface flakes and 35 subsurface flakes (Table 10.2). These two assemblages are combined for the following discussion. Approximately two-thirds of the surface flakes are exposed in two concentrations near the center of the site. Locally procured raw material types are present at the site, with orthoquartzite and chert accounting for over 80% of the assemblage. Although simple flakes dominate the assemblage, nearly one quarter of the flakes are complex. Two-thirds of the flakes have no cortex. Eighty percent of the flakes are smaller than 1". The smallest flake size (<½") accounts for slightly over 40% of these flakes.

The combination of these characteristics suggests that middle- to late-stage reduction activities were practiced at the site. The prevalence of generally smaller flakes and the high percentage of flakes without cortex implies the practice of late-stage reduction activities. The high number of simple flakes, some with cortex, is more indicative of middle stages of reduction. Flakes were typed according to the categories defined by Sullivan and Rozen (1985) as well. The high number of flake fragments and broken flakes suggest that later stages of reduction, particularly tool manufacturing activities, were taking place at the site. The presence of complete flakes indicates that core reduction was practiced, but in a more limited capacity. The presence of three cores supports the practice of core reduction. Interestingly, one of the three cores is silicified wood, but only two silicified wood flakes are present in this sample. This suggests that the silicified wood core may have been prepared elsewhere.

Subsurface testing at the site determined that the majority of artifacts are principally confined to the surface with a sparse subsurface deposit. Ten of the twenty-nine shovel tests recovered subsurface material. Five of these shovel tests were within the two artifact concentrations. Shovel test artifacts comprise 13 flakes, 3 utilized flakes, 2 bifaces, and a retouched flake. With one exception, all artifacts were found in the first 25 cm, with over one-half in the first 10 cm. Artifacts were recovered from

Table 10.2. Surface and subsurface non-tool flaked-lithic debitage, 5PE1785, FCMR.

Material	Quartzite/Orthoquartzite				Chert				Chalcedony				Silicified Wood				Total	
Type	S	SS	Subtotal	%	S	SS	Subtotal	%	S	SS	Subtotal	%	S	SS	Subtotal	%	No.	%
Size Grade																		
>1"	21	4	**25**		14	0	**14**		0	0	**0**		0	0	**0**		**39**	*19.9*
1/2" - 1"	28	4	**32**		25	1	**26**		12	1	**13**		1	1	**2**		**73**	*37.2*
<1/2"	15	8	**23**		34	11	**45**		11	5	**16**		0	0	**0**		**84**	*42.9*
Total	**64**	**16**	**80**	*40.9*	**73**	**12**	**85**	*43.3*	**23**	**6**	**29**	*14.8*	**1**	**1**	**2**	*1*	**196**	*100*
Flake Type (Ahler 1997)																		
Shatter	1	0	**1**		3	1	**4**		0	0	**0**		0	1	**1**		**6**	*3*
Simple	59	9	**68**		47	6	**53**		18	5	**23**		1	0	**1**		**145**	*74*
Complex	4	7	**11**		23	5	**28**		5	1	**6**		0	0	**0**		**45**	*23*
Bifacial Thinning	0	0	**0**		0	0	**0**		0	0	**0**		0	0	**0**		**0**	*0*
Total	**64**	**16**	**80**	*40.9*	**73**	**12**	**85**	*43.3*	**23**	**6**	**29**	*14.8*	**1**	**1**	**2**	*1*	**196**	*100*
Cortex																		
Present	27	5	**32**		22	3	**25**		6	0	**6**		0	1	**1**		**64**	*32.7*
Absent	37	11	**48**		51	9	**60**		17	6	**23**		1	0	**1**		**132**	*67.3*
Total	**64**	**16**	**80**	*40.9*	**73**	**12**	**85**	*43.3*	**23**	**6**	**29**	*14.8*	**1**	**1**	**2**	*1*	**196**	*100*
Flake Type (Sullivan and Rozen 1985)																		
Complete	14	3	**17**		25	1	**26**		6	1	**7**		1	0	**1**		**51**	*26*
Broken	26	10	**36**		17	4	**21**		6	1	**7**		0	0	**0**		**64**	*32.6*
Flake Fragment	23	3	**26**		28	6	**34**		11	4	**15**		0	0	**0**		**75**	*38.3*
Debris	1	0	**1**		3	1	**4**		0	0	**0**		0	1	**1**		**6**	*3.1*
Total	**64**	**16**	**80**	*40.9*	**73**	**12**	**85**	*43.3*	**23**	**6**	**29**	*14.8*	**1**	**1**	**2**	*1*	**196**	*100*

S Surface
SS Subsurface

both test units. Fourteen flakes were found in the first 7 to 13.5 cm below ground surface in Test Unit 1. The next 20 to 33 cm of this test unit were culturally sterile. The artifacts occur in the upper two strata. Eight flakes and one utilized flake were recovered from Test Unit 2. No artifacts were recovered from the initial 2 to 6 cm, which consisted of a dense sod. Subsequent artifacts were found in every level. Excavations were terminated between 26 and 36 cm below the ground surface. Although the last 10-cm-level did not recover any artifacts in the field, the control sample produced two very small flakes. One explanation for the occurrence of artifacts in the control sample is that heavy bioturbation in this area mixed the sediments from the layers above. All three control samples were taken from this disturbed area, and the three flakes recovered from the control sample were small (<¼"), possibly indicating vertical movement.

Comparisons were made between the subsurface and the surface flakes. Although the subsurface remains represent a small percent (17.9%) of the total, there is no real difference in the percentage of raw material types between the two assemblages. With regards to flake size, there is a higher percentage of small flakes in the subsurface, which is understandable since smaller flakes are more difficult to see on the surface. A slightly greater number of complex flakes in the subsurface corresponds with the higher percentage of smaller flakes. Of the seven flakes retrieved from the control samples in both test units, six are smaller than ¼" and could have fallen through the conventional ¼" mesh. The presence of small debitage in the control samples suggests that smaller flake types such as thinning or resharpening flakes are probably present at the site, although they do not appear in our surface sample. The greater percentages of small and complex flakes in the subsurface sample support the view that late-stage reduction activities, such as tool production, were a common activity at the site. Although the percentages for Sullivan and Rozen (1985) flake types differ slightly for subsurface flakes, in general they suggest more of a tendency towards tool manufacturing.

Groundstone

The sandstone metate fragment displays evidence of light smoothing and some pecking on one surface. This artifact was recorded and left at the site. Additional information on the metate is provided in Appendix IV.

Summary and Conclusions

The number of artifacts at the site suggests that the site was occupied for either an extended period of time or was repeatedly revisited. Despite the large number of

artifacts in our sample, the overall artifact assemblage lacks diversity. Nearly ninety percent of the artifact assemblage consists of flakes. Expedient tools, unfinished or broken bifaces, cores, and a hammerstone were the only tools present at the site. Later stages of reduction, particularly tool manufacturing activities, were most likely the dominant flaking activity at the site. The presence of a few cores and one hammerstone reinforce this interpretation. Locally procured raw materials were exploited with a heavy reliance on orthoquartzite and chert. The two artifact concentrations were probably the primary focus of intense but temporary activities concerned with lithic reduction. Since no diagnostics artifacts are documented at the site, the date of the site remains inconclusive.

Surface examination and subsurface testing at 5PE1785 have demonstrated that artifacts at the site are concentrated on the surface and in shallow deposits below the surface. Subsurface testing failed to identify a buried cultural component at the site. The site is therefore not recommended as eligible for nomination to the NRHP because so little can be understood about it that it is not possible to determine if specific important research questions can be answered by data contained in the property.

CHAPTER 11
5PE1800

Introduction

This site is a large (5,830 m^2) but sparse prehistoric open site lacking features with a light scatter of flaked-lithic artifacts. It was recorded by FLC in 1995 (Charles et al. 1997:6.44-48). When originally recorded, the surface assemblage included ten flakes, one utilized flake, one retouched flake, one core, one denticulate, one chopper, and one uniface/spokeshave. The type and diversity of artifacts suggested that activities such as unintensive core reduction and animal or plant processing were conducted at the site. A few of the artifacts were partially covered with sediments, indicating a good probability for buried artifacts and perhaps buried cultural deposits. A lack of diagnostic artifacts, however, precluded a finer temporal affiliation. The site is situated at the headwaters of a tributary of Turkey Creek and adjacent to several meadows that drain into the tributary. The tributary drainage is a natural transportation route from the Turkey Creek lowlands to the interior of Booth Mountain.

This site was recommended as eligible for nomination to the NRHP because of the potential for buried deposits, the particular topographic situation, and the diverse artifact assemblage, which indicated multiple site function. Additionally, there are few archeological sites in the upland areas that are not adjacent to either alcoves or mesa tops. Perhaps the dearth of archeological sites in these upland regions is a factor of limited water supplies and inhospitable terrain. This site is in a topographic situation that is rare for much of the uplands in that it has access to open meadows and seasonal water sources.

The site is along the gentle slope of a north–south trending ridge within the interior of Booth Mountain (Stone City U.S.G.S. 7.5' quadrangle [Figure 11.1]) and at an elevation of 6,070 ft (1,850 m) asl. This site is in a pinyon and juniper woodland (Figure 11.2). Most of the site is within open grassy areas. Other vegetation at the site includes cacti, tall and short grasses, snakeweed, buckwheat, and mountain mahogany. Sediments consist of residuum from weathered sandstone, which is transported to the site through colluvial and alluvial processes. Sandstone gravels are exposed on the more eroded areas. Eolian sediments probably constitute a minor portion of the total sediment matrix. The site is in good condition, with only minimal evidence of surface disturbance from tracked-vehicles along the site's southern and western boundaries. The northern half of the site is dissected by small, easterly flowing ephemeral drainages. These drainages empty into a larger southerly flowing drainage that is east of the site.

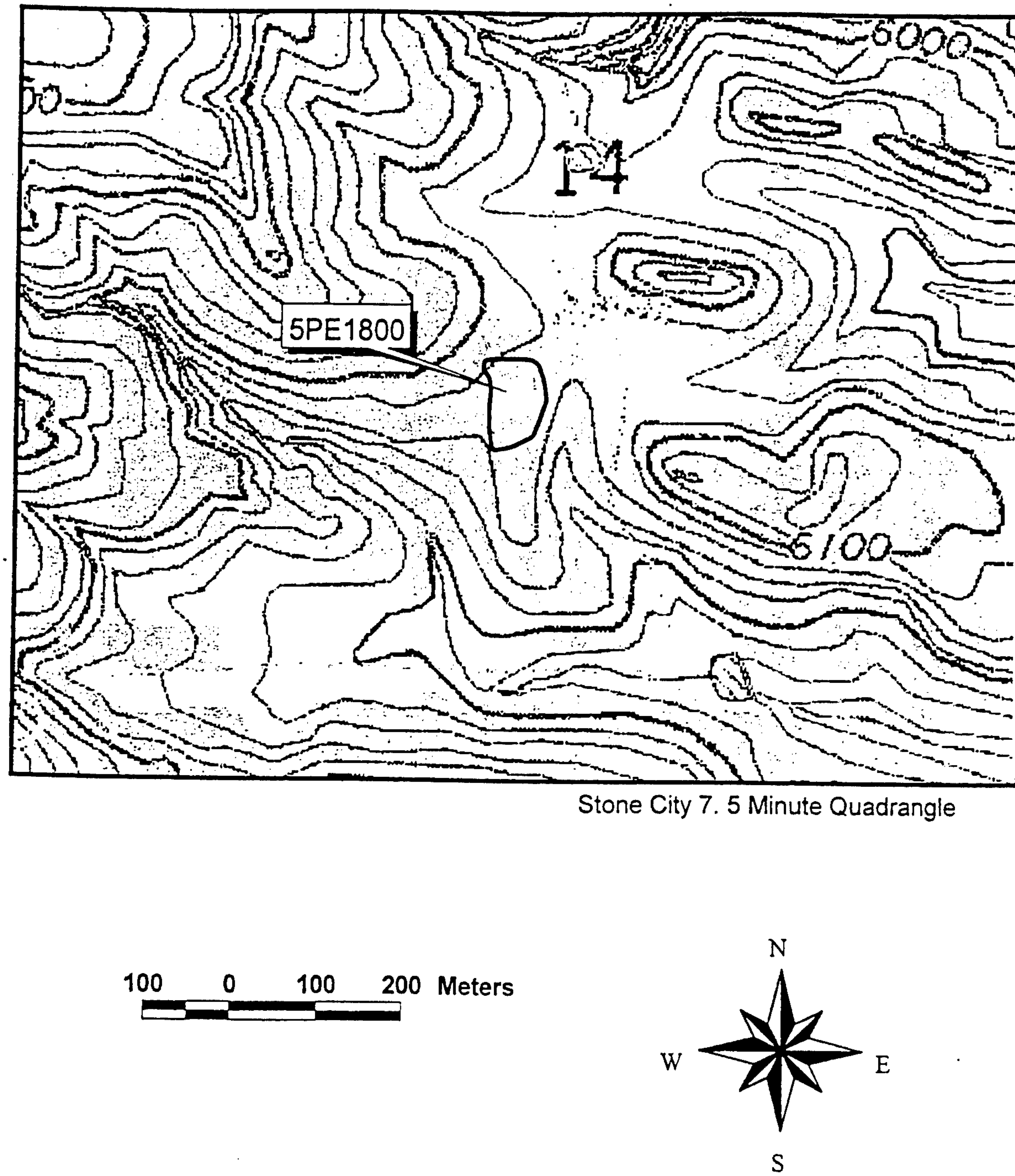


Figure 11.1. Location map, 5PE1800

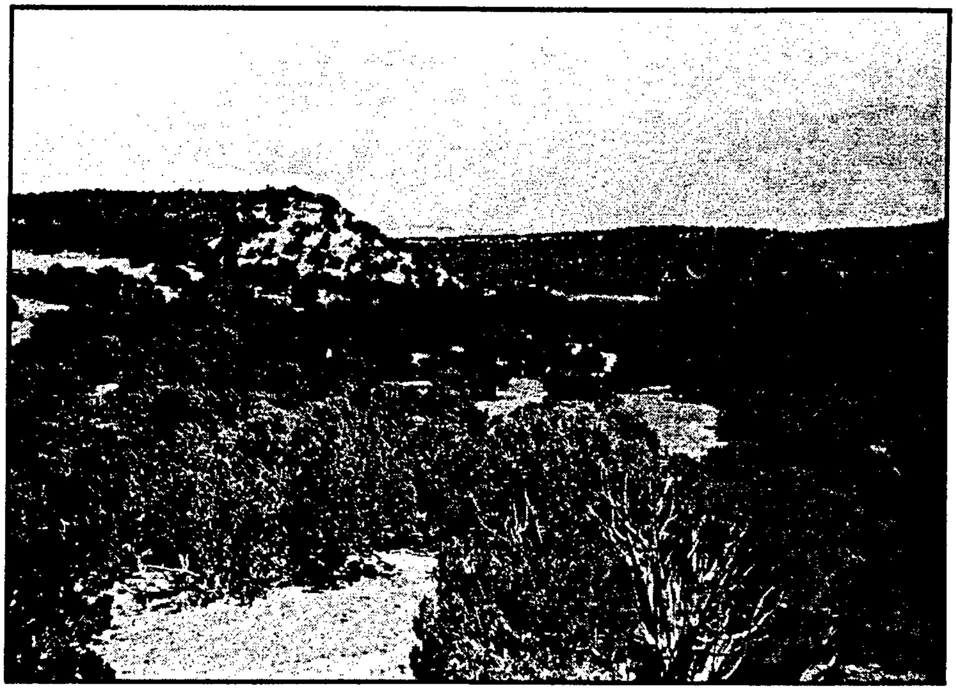


Figure 11.2. Site overview, 5PE1800, FCMR. View is to the southeast.

Surface Investigations

The surface inventory was accomplished through a combination of non-random transects and random pedestrian coverage. Forty-four flaked-lithic artifacts were noted from the surface. Forty flakes and one core were analyzed in the field, while one projectile point, one scraper, and a chopper were collected for further analysis. These artifacts represent the entire surface assemblage from the site.

Once the site boundary was defined, a map was constructed using the Total Station (Figure 11.3).

Subsurface Investigations

Forty-four shovel tests were placed at the site along with two test units.

Shovel Tests

Forty-four shovel tests were excavated in three lines across the site. Shovel tests were placed a distance of four meters apart. They were excavated to culturally sterile

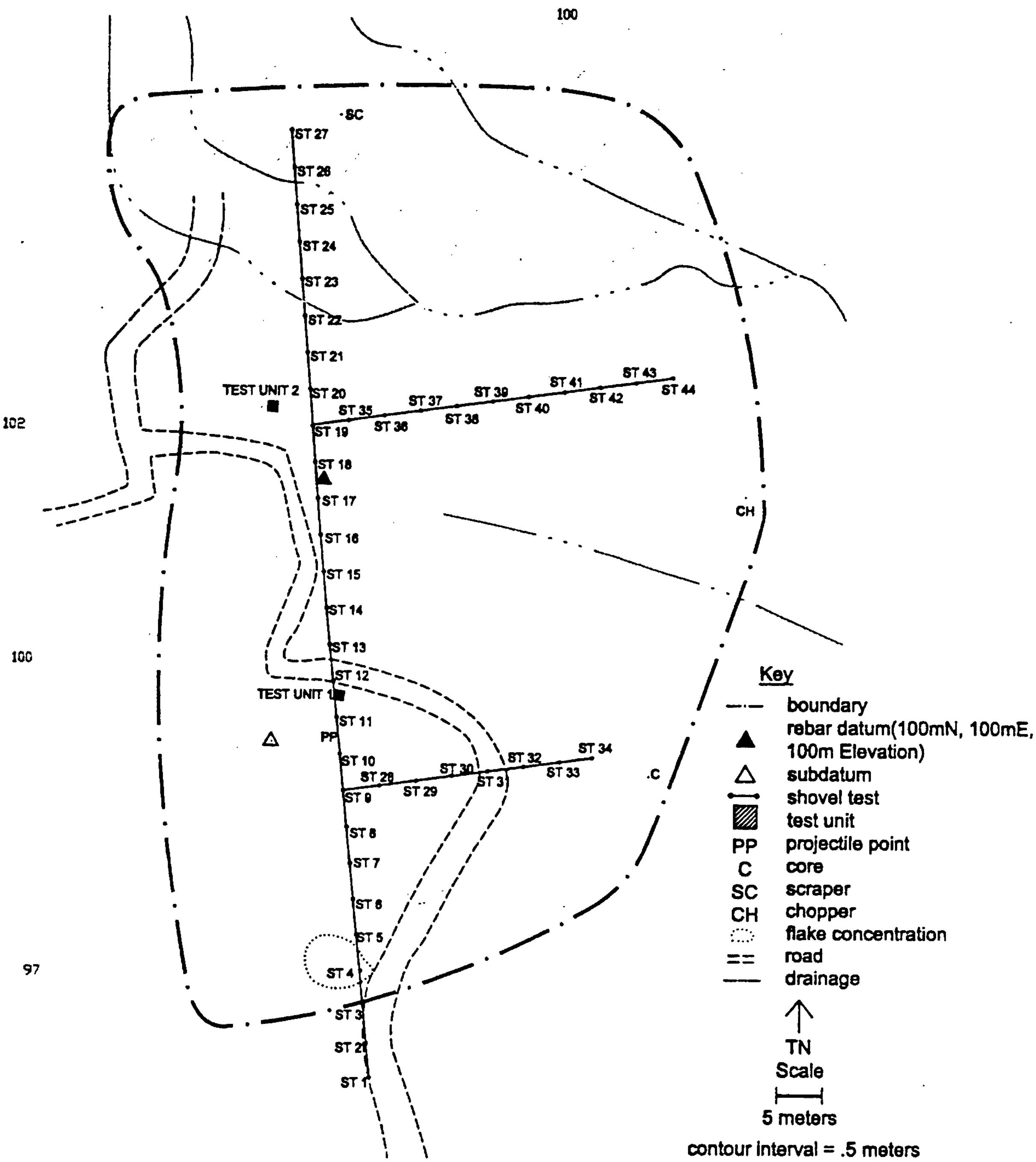


Figure 11.3. Site map, 5PE1800, FCMR.

sediments, to bedrock, or until the test hole could no longer be excavated with the available equipment (~70 cm). Three shovel test lines were excavated at the site. The first line was placed parallel with the long axis of the site in a north–south direction. Twenty-seven shovel tests were excavated along this line, which ran the entire length of the site. Two shorter shovel test lines were placed perpendicular to, and east of, the first shovel test line. The first shovel test line intersected at Shovel Test 9 and the second line at Shovel Test 19. A single flake was found in Shovel Test 31 near the southeast portion of the site. The shovel tests were of little aid in isolating areas for test units. Instead, the test units were placed in areas with sufficient sediment build-up to allow for the potential of subsurface deposits. Detailed stratigraphic descriptions of the shovel tests are provided in Appendix II.

Test Units

Two test units were excavated at the site. Test Unit 1 was placed in an open area where shovel tests had shown that there was at least 30 cm of sediment depth. A second test unit was excavated near the western site edge, also in an open area with potential for sediment depth. Test unit results are summarized in Table 11.1.

Table 11.1. Test unit summaries, 5PE1800, FCMR.

Test Unit No.	Layer	Level	Thickness Range (bgs)	Materials Recovered ¼"	Control 1/16"
1	1	*	0-3 cm	None	No control sample
1	2	1	3-10 cm	None	None
1	2	2	6-16.5 cm	None	None
1	3	1	0-10 cm	None	None
1	3	2	9.5-10 cm	None	None
1	3	3	9.5-10 cm	None	None
1	3	4	9.5-11 cm	None	None
1	3	5	8.5-11 cm	None	None
2	2	*	6.5-11 cm	None	None
2	3	1	11-13.5 cm	None	None

* Excavated as a single stratigraphic unit.

Test Unit 1

Test Unit 1 was placed in the southern one-third of the site and adjacent to the first line of shovel tests. The unit was excavated in three layers to a total depth of between 61 and 68 cm below the ground surface. The datum was placed in the northeast corner (76.81 mN, 102.46 mE, 0.487 mbsd), and the control sample was collected from the northwest corner. Layer 1 consisted of the loose sod zone with pebbles and grass roots. This layer was between 0 and 13 cm thick. No artifacts were recovered from this layer. Layer 2 began at the bottom of the sod layer and was excavated in two levels to a maximum depth of 20 cm below the ground surface. Layer 2 consisted of fine and coarse sand with grass roots and pebbles. Near the bottom of the layer, charcoal flecking was noted along with larger roots and horizontal pieces of sandstone. At the contact with the sandstone, a layer change to Layer 3 was introduced. No artifacts were recovered from Layer 2. Layer 3 was excavated in five levels. The sediments were more compacted, with fine and coarse sand and silt. Cobble-size sandstone rocks and large roots increased in the layer with increased depth until the entire layer comprised decomposing sandstone.

Three strata were recognized in the west (east-facing) wall profile, and four strata were identified in the north (south-facing) profile (Figure 11.4). The strata are described below.

Stratum I — Stratum I is a thin (1 - 8 cm) layer of sod. The stratum is a dark-brown (10YR 4/3) fine sand. The soil structure is single grain, and the lower boundary is gradual and undulating. The stratum contains grass roots and between 5% and 10% of well-sorted, rounded and subangular sandstone gravels. The sediments react violently to hydrochloric acid. There are no artifacts in the stratum.

Stratum II — Stratum II is a dark yellowish brown (10YR 4/4) loamy sand. It has a subangular blocky soil structure that is moderately developed. The stratum is between 10 and 25 cm thick. The lower boundary is clear and undulating. Dense grass roots are present in the stratum. The stratum reacts violently to hydrochloric acid. There are no cultural inclusions in the stratum. Gravels of decomposing sandstone account for between 5% and 10% of the matrix. These gravels are rounded or subangular and are well-sorted.

Stratum III — Stratum III is a thick (50 cm) layer of yellowish brown (10YR 5/4) loamy sand. The soil structure is subangular blocky and well developed. The lower boundary is smooth and clear. There is a slight reaction to hydrochloric acid. Tree roots increase over the smaller grass roots, and

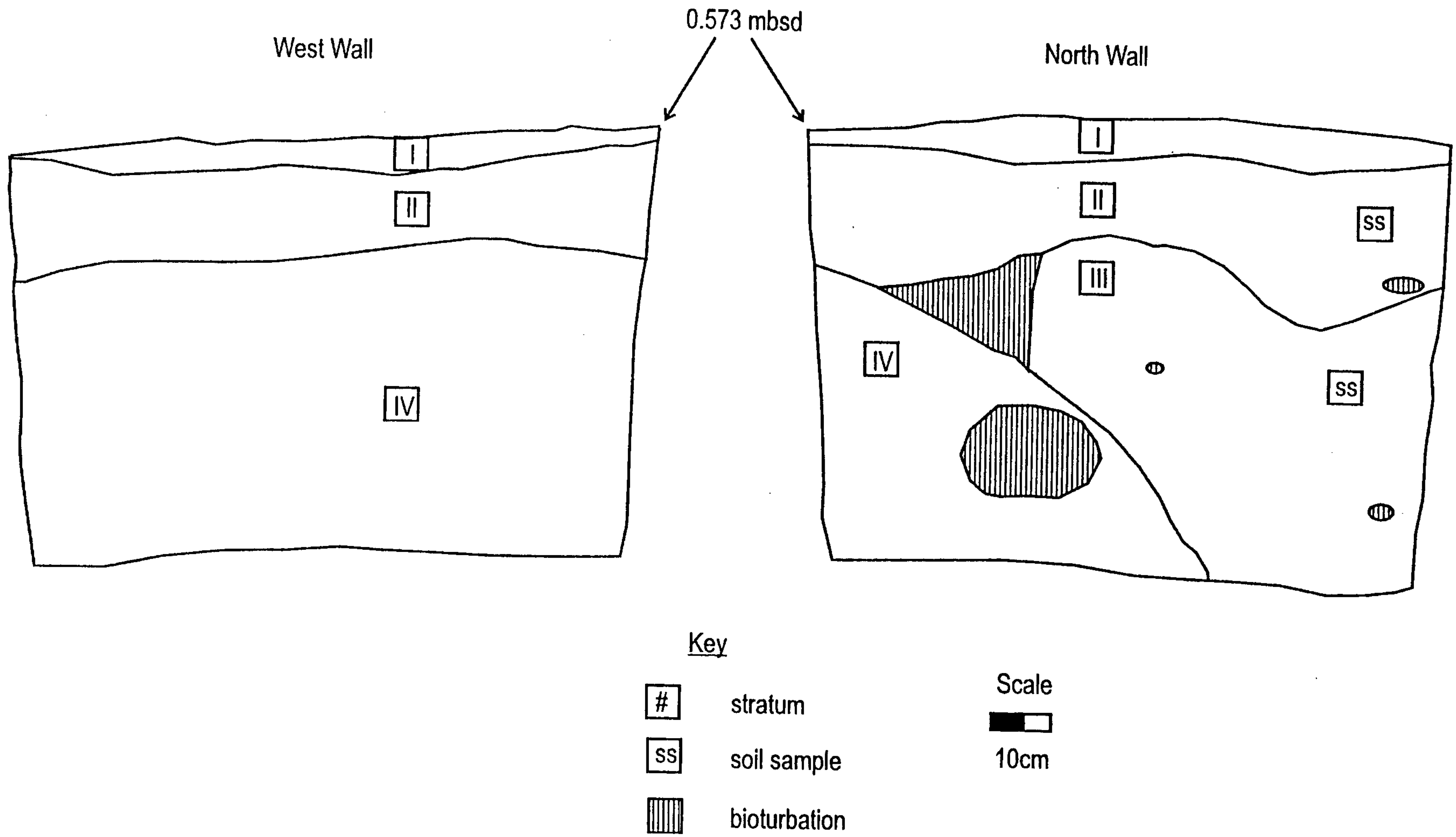


Figure 11.4. West-wall profile and north-wall profile, Test Unit 1, 5PE1800, FCMR.

no artifacts are present in the stratum. Rounded and subangular well-sorted gravels of decomposing sandstone account for between 5% and 10% of the matrix.

Stratum IV — Stratum IV is a thick layer of very pale brown (10YR 7/4) sand. The lower boundary remains concealed. The stratum is composed of between 80% and 90% sandstone slabs and decomposing sandstone. Tree roots continue in the stratum, which has no cultural inclusions. The sediments react violently to hydrochloric acid. There is no soil structure to this Cr horizon.

Test Unit 2

Test Unit 2 was placed northwest of the site datum in an area of landscape stability. The unit was excavated in two layers to a maximum depth of between 20 and 23 cm below the surface. The datum was placed in the unit's northwest corner (108.55 mN, 93.805 mE, 0.512 masd), where the control sample was taken as well. There was no sod layer, so excavations began in Layer 2. Layer 2 was removed as a single layer and ranged from 6.5 to 10 cm thick. No artifacts were found in this loose topsoil. A layer change to Layer 3 was initiated when the sediments became compact with numerous sandstone gravels. Excavation was terminated at the end of Level 1, Layer 3 due to a lack of artifacts and the nature of the gravelly (Cr) sediments.

Two strata were recognized in the west (east-facing) and the north (south-facing) wall profiles. These profiles are illustrated in Figure 11.5, and they are described below.

Stratum I — Stratum I, the sod layer, was absent from this test unit.

Stratum II — Stratum II is a dark yellowish brown (10YR 4/4) fine silty sand. The soil structure is moderately well developed and subangular blocky. The lower boundary is clear and undulating. There are grass and tree roots in the stratum, which is between 4 and 15 cm thick. Rounded and subangular well-sorted sandstone gravels comprise about 7% of the sediment matrix. There were no artifacts recovered from this stratum. The stratum reacts slightly to hydrochloric acid.

Stratum III — Stratum III is a yellowish brown (10YR 5/4), compact, fine silty sand. The structure is well developed and subangular blocky. The lower boundary remains concealed. The stratum reacts slightly to hydrochloric acid. There are roots in the stratum and about 10% well-sorted rounded to subangular sandstone gravels. No artifacts were recovered from this stratum.

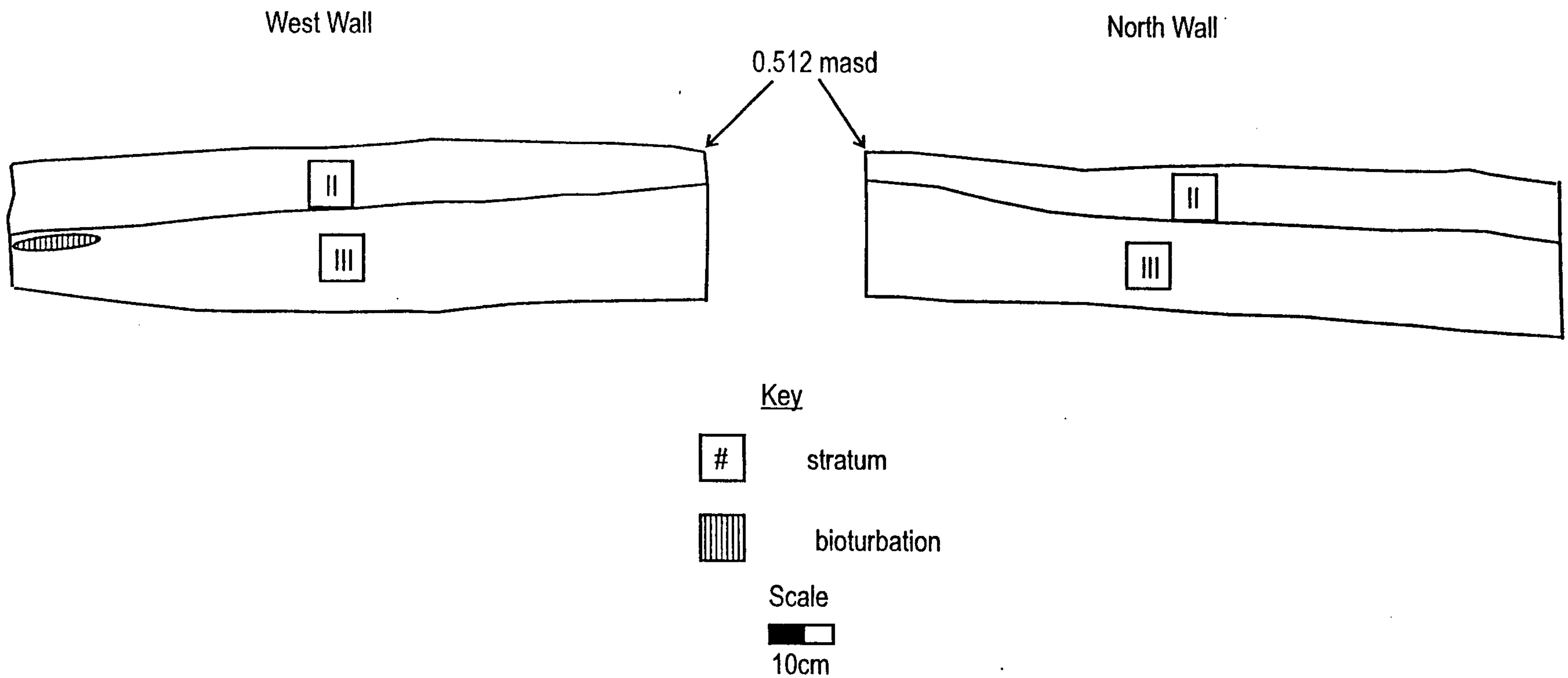


Figure 11.5. West-wall profile and north-wall profile, Test Unit 2, 5PE1800, FCMR.

Material Culture

A total of forty-five flaked-lithic artifacts comprise the artifact assemblage. These artifacts include forty-one non-tool flaked-lithic artifacts, one core, one chopper, one scraper, and one projectile point. One core and the flakes were analyzed in the field. Over half of the surface flakes are found in a small concentration on the south edge of the site. The three tools were collected for further analysis. A single chalcedony flake recovered from Shovel Test 31 is the only subsurface artifact from the site. Quantitative information on the flaked tools and core is found in Appendix III.

Flaked-Lithic artifacts

A stemmed projectile point (5PE1800.1a) was collected from the surface (Figure 11.6). This projectile point is the only diagnostic artifact from the site. The very tip of the blade and the tip of one shoulder are missing. The projectile point is manufactured from red chert. Other physical characteristics include an elongated triangular blade with straight edges, barbed shoulders, a narrow neck, a slightly expanding stem, round tangs, a straight base, and a bi-convex cross-section. The center of the stem and the center of the bottom half of the blade show no flake scars. This specimen resembles a few of the projectile points typed as Category P42 for Pinon Canyon (Lintz and Anderson 1989:160). However, most of the Pinon Canyon specimens have wider stems. Category P42 projectile points date from AD 600 to AD 1600. Category P59 projectile points (Lintz and Anderson 1989:187) have some comparable attributes, but projectile points in this category are generally smaller than the specimen from 5PE1800. Category P59 projectile points date between AD 500 and AD 1200. One example, a Type 14 from Recon John Shelter (Zier 1989:141), and another example, a Type J from the LoDaiska site (Irwin and Irwin 1959:31), are similar to 5PE1800.1a from this site. Based on the above comparisons, the projectile point from 5PE1800 probably dates from the late Developmental to the early Diversification periods.

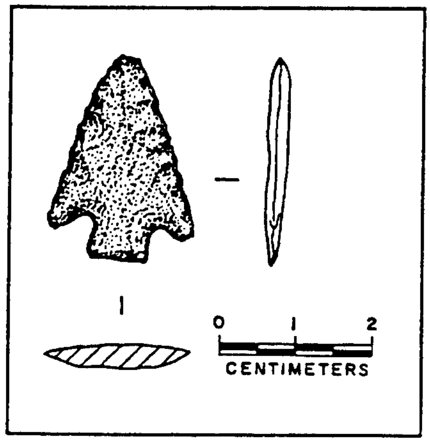


Figure 11.6. Projectile point 5PE1800.1a, FCMR.

The scraper is made from a complete white chert flake. This complete specimen has patterned unifacial flaking along one edge. The thickness of the flake was beneficial in the creation of the beveled edge. There is evidence of unifacial use wear along the modified edge. The chopper is manufactured from a tabular piece of orthoquartzite

with naturally pointed edges on two margins. On one of these edges, four small flakes were removed in an attempt to sharpen the edge. The lack of observable use wear suggests that the tool was minimally used. Eighty percent of the weathered cortex remains. The core, which is bidirectional and consists of a large piece of tabular orthoquartzite, was analyzed in the field. Numerous flakes were removed, and 30% of the cortex remains.

Interpretations on the non-tool flaked-lithic assemblage are limited by the small sample. The subsurface data are combined with the surface artifact data in Table 11.2. Locally derived raw materials were used extensively at the site, with orthoquartzite accounting for the majority of the assemblage. Simple flakes are the most common flake type, and the majority of the flakes lack cortex.

These characteristics suggest that middle- and late-stage reduction activities were the most prevalent flaking activities at the site. The paucity of complex flakes and the relatively low number of flakes with cortex support this interpretation. The generally smaller flake size may reflect late-stage reduction activities as well. Classification and interpretation under the Sullivan and Rozen (1985) system suggest that tool manufacturing was the primary flaking activity at the site, and the high percentage of flake fragments combined with the relatively high number of broken flakes support this interpretation. The presence of one large core at the site indicates that some core reduction was probably taking place at this location as well.

Summary and Conclusions

These lithic reduction interpretations may be misleading because of the relatively small sample. However, the low number of artifacts and the lack of variety within the overall artifact assemblage indicate that the site was only occupied for a short time. A single projectile point tentatively dates the site's occupation to the late Developmental or early Diversification periods. Subsurface testing at the site confirms that the artifacts are limited to the surface. Two test units and forty-three shovel tests failed to identify subsurface cultural material at the site. The one subsurface artifact was found in a shovel test at a depth no greater than 5 cm. Although sediments at the site exceeded 70 cm in many of the shovel tests, only one shovel test recovered artifacts. Testing at this site has demonstrated that artifacts are restricted to surface or near-surface contexts and that there is little to no potential for substantive buried deposits. Therefore, the site is not recommended as eligible for nomination to the NRHP because so little can be understood about it that it is not possible to determine if specific important research questions can be answered by data contained in the property.

Table 11.2. Surface and subsurface non-tool flaked-lithic debitage, 5PE1800, FCMR.

Material	Quartzite/Orthoquartzite				Chert				Chalcedony				Silicified Wood				Total	
Type	S	SS	Subtotal	%	S	SS	Subtotal	%	S	SS	Subtotal	%	S	SS	Subtotal	%	No.	%
Size Grade																		
>1"	7	0	7		2	0	2		0	0	0		0	0	0		9	22
1/2" - 1"	7	0	7		0	0	0		0	0	0		1	0	1		8	19.5
<1/2"	15	0	15		6	0	6		2	1	3		0	0	0		24	58.5
Total	29	0	29	70.7	8	0	8	19.5	2	1	3	7.3	1	0	1	2.5	41	100
Flake Type (Ahler 1997)																		
Shatter	0	0	0		2	0	2		0	0	0		0	0	0		2	4.9
Simple	22	0	22		4	0	4		2	0	2		0	0	0		28	68.3
Complex	7	0	7		2	0	2		0	1	1		1	0	1		11	26.8
Bifacial Thinning	0	0	0		0	0	0		0	0	0		0	0	0		0	0
Total	29	0	29	70.7	8	0	8	19.5	2	1	3	7.3	1	0	1	2.5	41	100
Cortex																		
Present	7	0	7		2	0	2		0	0	0		1	0	1		10	24.4
Absent	22	0	22		6	0	6		2	1	3		0	0	0		31	75.6
Total	29	0	29	70.7	8	0	8	19.5	2	1	3	7.3	1	0	1	2.5	41	100
Flake Type (Sullivan and Rozen 1985)																		
Complete	4	0	4		2	0	2		0	0	0		0	0	0		6	14.6
Broken	4	0	4		0	0	0		0	1	1		1	0	1		6	14.6
Flake Fragment	21	0	21		4	0	4		2	0	2		0	0	0		27	65.8
Debris	0	0	0		2	0	2		0	0	0		0	0	0		2	5
Total	29	0	29	70.7	8	0	8	19.5	2	1	3	7.3	1	0	1	2.5	41	100

S Surface
SS Subsurface

CHAPTER 12
5PE1803

Introduction

This site is a prehistoric open structural site and was recorded during the FLC inventory of portions of Booth Mountain (Charles et al. 1997:6.53-55). It was estimated that over 400 artifacts were exposed at the site. These artifacts consisted of a small number of tools (one complete metate, one possible metate fragment, and one uniface), and numerous chalcedony, quartzite, and chert flakes. During inventory a sample of flaked-lithic artifacts was analyzed in a 1-x-25-m transect through the densest artifact scatter. An overwhelming number of the artifacts from the transect are manufactured from white or red chalcedony. The dominance of this material type suggested the possibility of a source area in the vicinity. The non-tool flaked-artifact assemblage displayed a very high number of debris and flake fragments (76%). The large quantity of debris was believed to be a result of intensive core reduction to the point of thoroughly reducing the cores, an activity more suitable to long-term occupation rather than a short-term stay. The lack of formal tools at the site was curious, given the large numbers of flakes. The presence of a complete metate, however, suggests that activities other than tool manufacture or core reduction were practiced at the site.

A stacked-stone feature was identified at the southeast edge of the site and adjacent to the large drainage. This feature rests on exposed sandstone. The feature was interpreted to be of prehistoric origin; however, a military origin was not entirely dismissed, although no other evidence of military activity was noticed near the feature.

The site was recommended as eligible for nomination to the NRHP because of its potential for buried deposits, and because of the potential to yield significant information on the settlement and subsistence patterns on the FCMR (Zier et al. 1987) and for the Plains Mountain–transition (Eighmy 1984).

This relatively large site covers an area of 8,001m^2 (Stone City, U.S.G.S. 7.5' quadrangle [Figure 12.1]). It is on the eastern end of a broad and gently sloping ridge (3°) that is bounded by steep canyons to the north and east. It is adjacent to a unnamed ephemeral drainage to the south. This drainage quickly downcuts to form a steep-walled canyon that eventually flows into Turkey Creek 2.5 km to the east. Elevation is 6,220 ft (1,896 m) asl, and the aspect is to the east and southeast. Bedrock is exposed along the rim above the drainage, but in the meadow sediment depth is

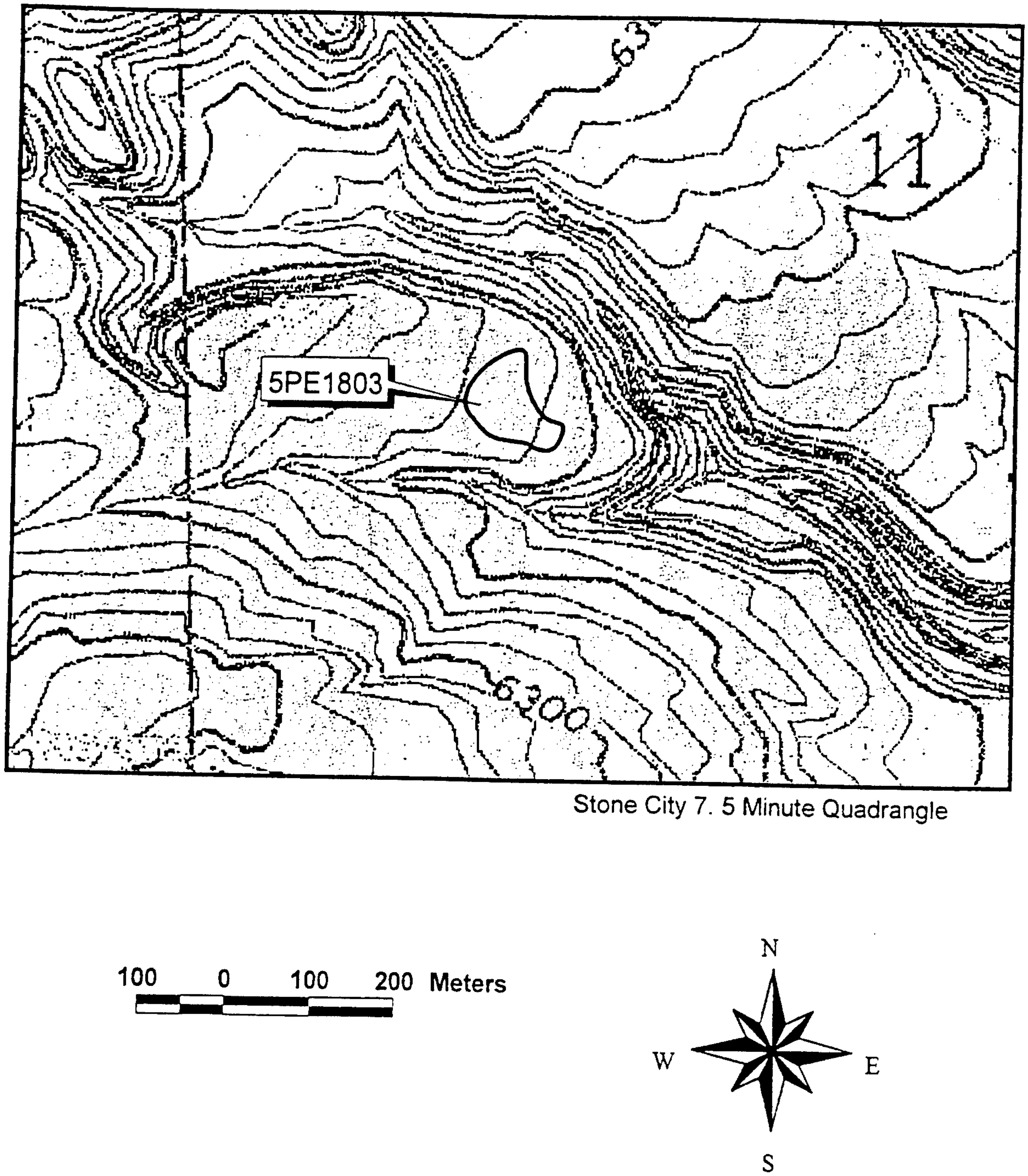


Figure 12.1. Location map, 5PE1803, FCMR.

believed to be great enough to conceal buried cultural deposits. Sediments consist of a gravelly loam, which are derived from residual weathering of the bedrock. There are also small accumulations of eolian silt. The site is in a pinyon and juniper woodland. Other vegetation includes narrow-leaf yucca, cacti, snakeweed, sunflower, fringe sage, scrub oak, mountain mahogany, skunkbush, and various grasses. Small grassy areas occur within the woodland, and a large meadow is present along the western edge of the site (Figure 12.2). The site is in relatively good condition, with some minor impacts from erosion and military disturbance in the form of mechanized vehicular traffic.

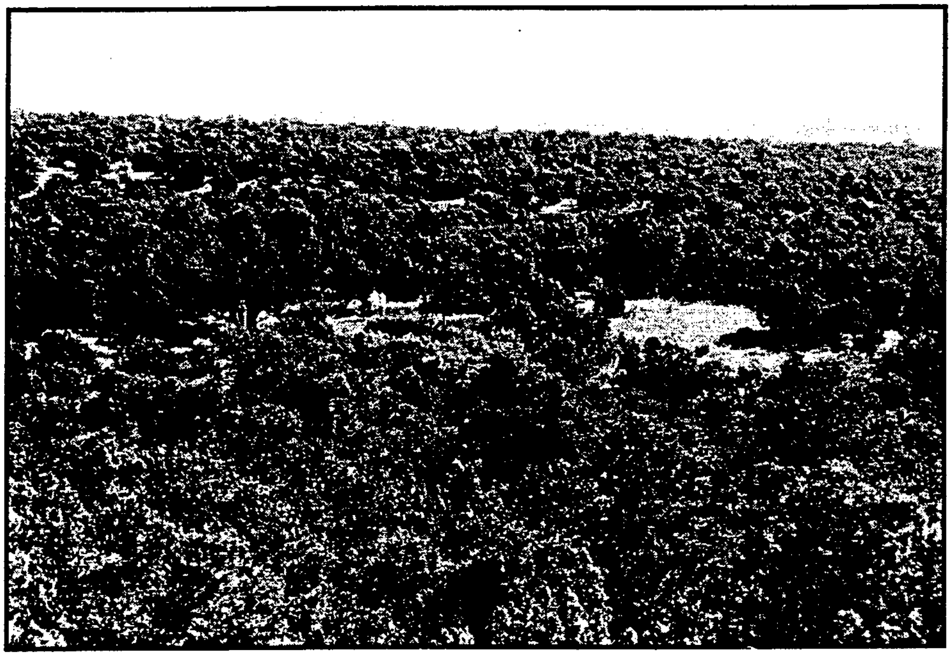


Figure 12.2. Site overview, 5PE1803, FCMR. View is to the northeast.

Surface Investigations

A survey of the site was conducted in transects, flagging all tools and artifact concentrations. A sample of 159 flakes was analyzed in the field along with ten cores and two metates. Collected artifacts included five utilized flakes, five retouched flakes, and one biface. The surface artifacts were primarily exposed in the open deflated areas. Once the site boundary had been defined, survey points were taken with the Total Station, and a site map was generated (Figure 12.3).

A stacked-stone feature (Feature 1) at the southeast end of the site was recorded. This feature is constructed on bedrock along the sandstone rim and overlooking a

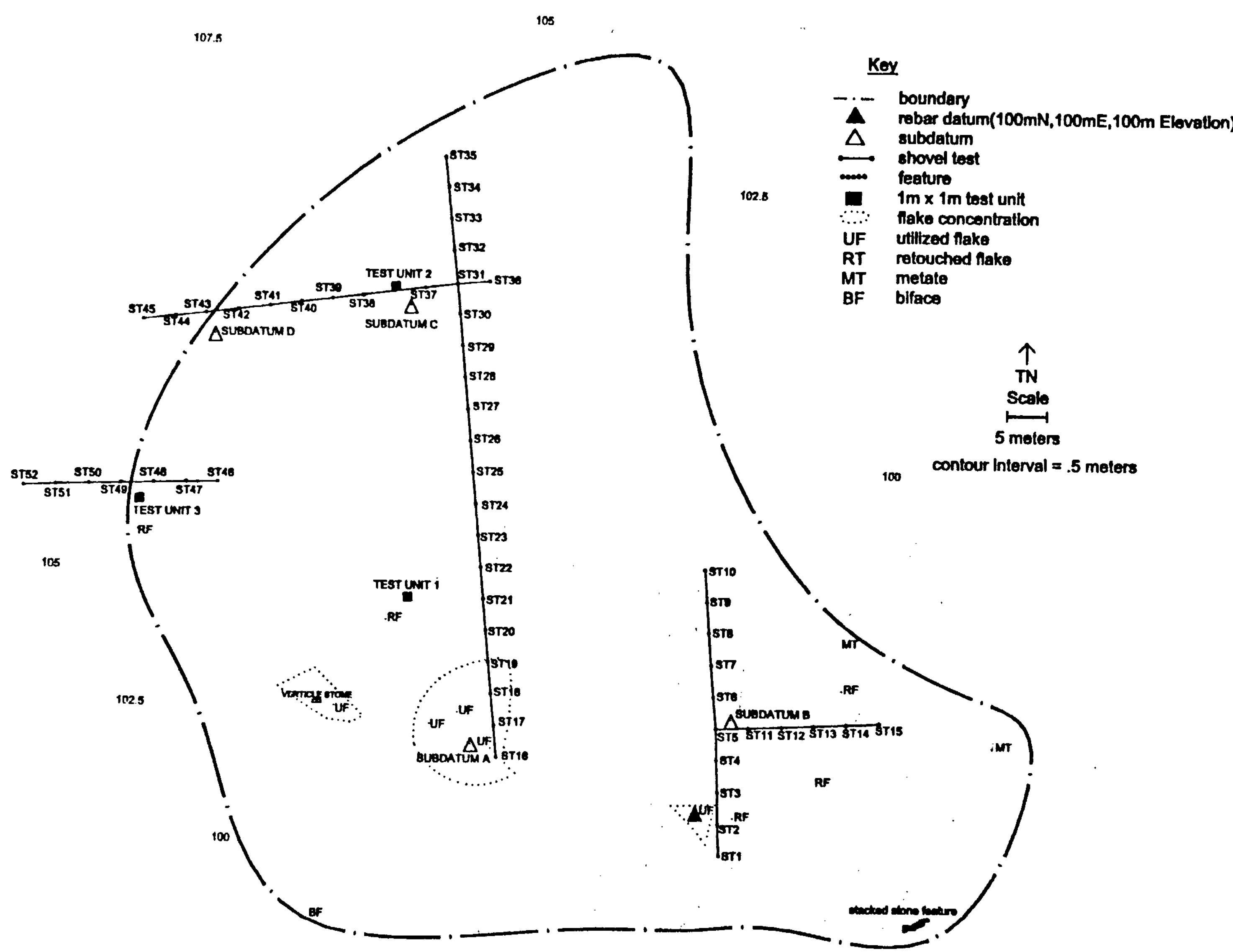


Figure 12.3. Site map, 5PE1803, FCMR.

drainage. The feature measures 4 x 0.9 x 0.4 m and embodies angular sandstone rocks. This feature includes a line of stacked sandstone (Figure 12.4) that is definitely cultural. It is not certain when the feature was constructed, but it probably dates to the prehistoric period. Most of the rocks' surfaces are covered with lichen, indicating long-term placement. No lichen was visible on the underside of the rocks. That lichen was on the rocks' surfaces but not on the underneath, supports a prehistoric origin for the feature.

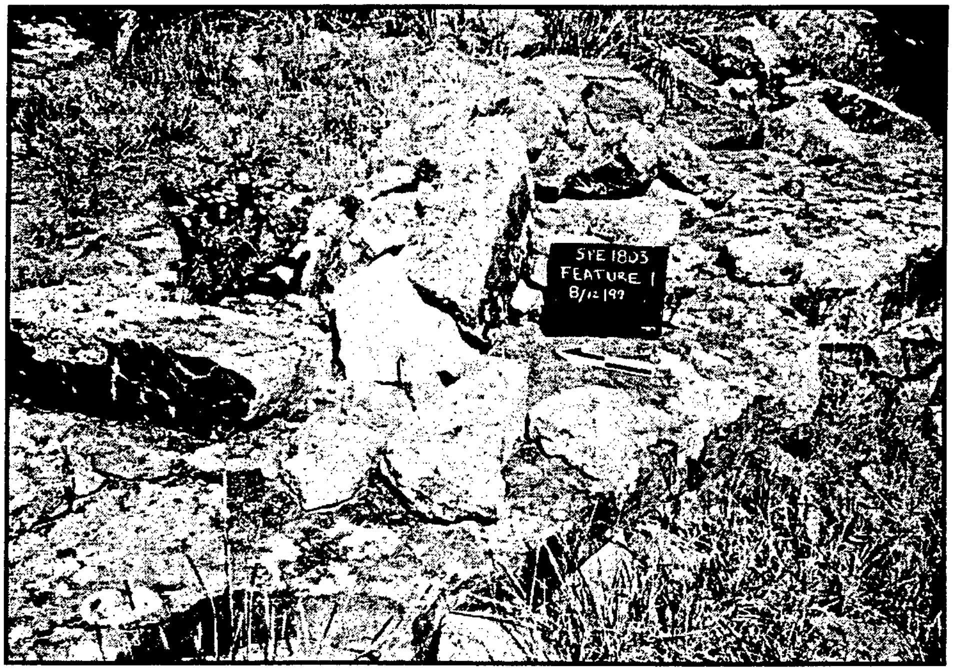


Figure 12.4. Stacked-stone feature, 5PE1803, FCMR. View is to the east.

Subsurface Investigations

Fifty-two shovel tests and three test units were excavated at this site.

Shovel Tests

Fifty-two shovel tests were excavated in five lines. Shovel tests were placed a distance of four meters apart. The shovel tests were excavated to culturally sterile sediments, to bedrock, or until the test hole could no longer be excavated with the available equipment (~70 cm). Of the fifty-two shovel tests, four (8%) contained artifacts. The first shovel test line began near the original site datum and was oriented in a north–south direction. Ten shovel tests were excavated in this line, none of which produced artifacts. A second line was placed perpendicular to the first line. This second

line, which contained five shovel tests (11-15), ran east from Shovel Test 5. No artifacts were recovered from these shovel tests. The third and longest line was placed near the middle of the site and ran almost the entire length of the site. Shovel Tests 16-35 were excavated in this line. Of 20 shovel tests, 3 produced subsurface artifacts. These three were separated by several meters, suggesting that the distribution of subsurface artifacts is light. A fourth line was placed perpendicular to the third line. Ten shovel tests were excavated along this line, which intersected the third shovel test line at Shovel Test 31. No artifacts were recovered from these tests. A fifth shovel test line was placed in the far western portion of the site. This line ran in an east–west direction and continued beyond the defined site boundary. Seven shovel tests were excavated along this line, and one shovel test produced a single flake. Stratigraphic descriptions of the shovel tests are presented in Appendix II.

Test Units

Three test units were placed in different areas of the site. The placement for the test units was decided through a combination of shovel test results, surface artifact concentrations, surface charcoal, and possible fire-cracked rock. Most importantly, shovel testing had revealed areas of the site with the potential for subsurface cultural deposits. Results from the test unit excavations are summarized in Table 12.1.

Test Unit 1

Test Unit 1 was placed in a flat area upslope of a flake concentration. Here, charcoal and possible fire-cracked rock were exposed on the surface. The purpose of the test unit placement was to investigate the possibility of a burned feature. The unit was excavated in two layers to the contact with bedrock, 12.5 - 23. 5 cm below the ground surface. The control unit was taken from the northwest corner (127.22 mN, 63.19 mE, 3.35 masd). This corner also served as the datum location. The first layer consisted of silty loam with a large number of rocks and roots, but no true sod layer. Five flakes were recovered from this 8.5- to 12-cm-thick layer, with a single flake recovered from the control unit. The lower boundary of Layer 1 was very clear because of the very reddish color and increased charcoal at the contact. The size and amount of roots increased throughout Layer 2, while the number of gravels remained fairly consistent. At the bottom of Layer 2, sloping sandstone bedrock was encountered and excavations were terminated. There were no artifacts recovered from this 3- to-13-cm-thick layer. The reddish sediments continued to bedrock.

Table 12.1. Test unit summaries, 5PE1803, FCMR.

Test Unit No.	Layer	Level	Thickness Range (bgs)	Materials Recovered 1/4"	1/16" Control
1	1	*	8.5-12 cm	5 flaked-lithic artifacts, ^{14}C sample	1 flaked- lithic artifact
1/	2	*	3-13 cm	None	None
2	1	*	3.5-8.5 cm	None	No control sample
2	2	1	7-14 cm	None	None
2	2	2	10-11 cm	2 flaked-lithic artifacts	None
2	3	1	10-12 cm	None	None
2	3	2	10-13 cm	None	None
3	1	*	0-3 cm	None	No control sample
3	2	1	8-10 cm	None	None
3	2	2	8-10 cm	1 core, 1 utilized flake, 1 retouched flake	None
3	2	3	3-5 cm	None	None
3	3	1	8-10 cm	None	None

* Excavated as a single stratigraphic layer.

The west (east-facing) and the north (south-facing) wall profiles are illustrated in Figure 12.5. Three strata were recognized in the test unit.

Stratum I — Stratum II is a 9- to-17-cm-thick layer of a pink (7.5YR 7/4) sandy silt loam. The soil structure is moderately developed and angular blocky. The lower boundary is clear and wavy. Rocks and roots are common in the stratum, along with an occasional artifact. Rocks account for 10% to 15% of the total matrix. The sediments react slightly to hydrochloric acid.

Stratum II — Stratum III is a 2- to-10-cm-thick layer of brown (7.5YR 5/4) silty clay loam with a moderately developed and subangular blocky soil structure. The lower boundary is abrupt and undulating with the sandstone bedrock. Roots increase in the stratum as the artifacts decrease. Rocks

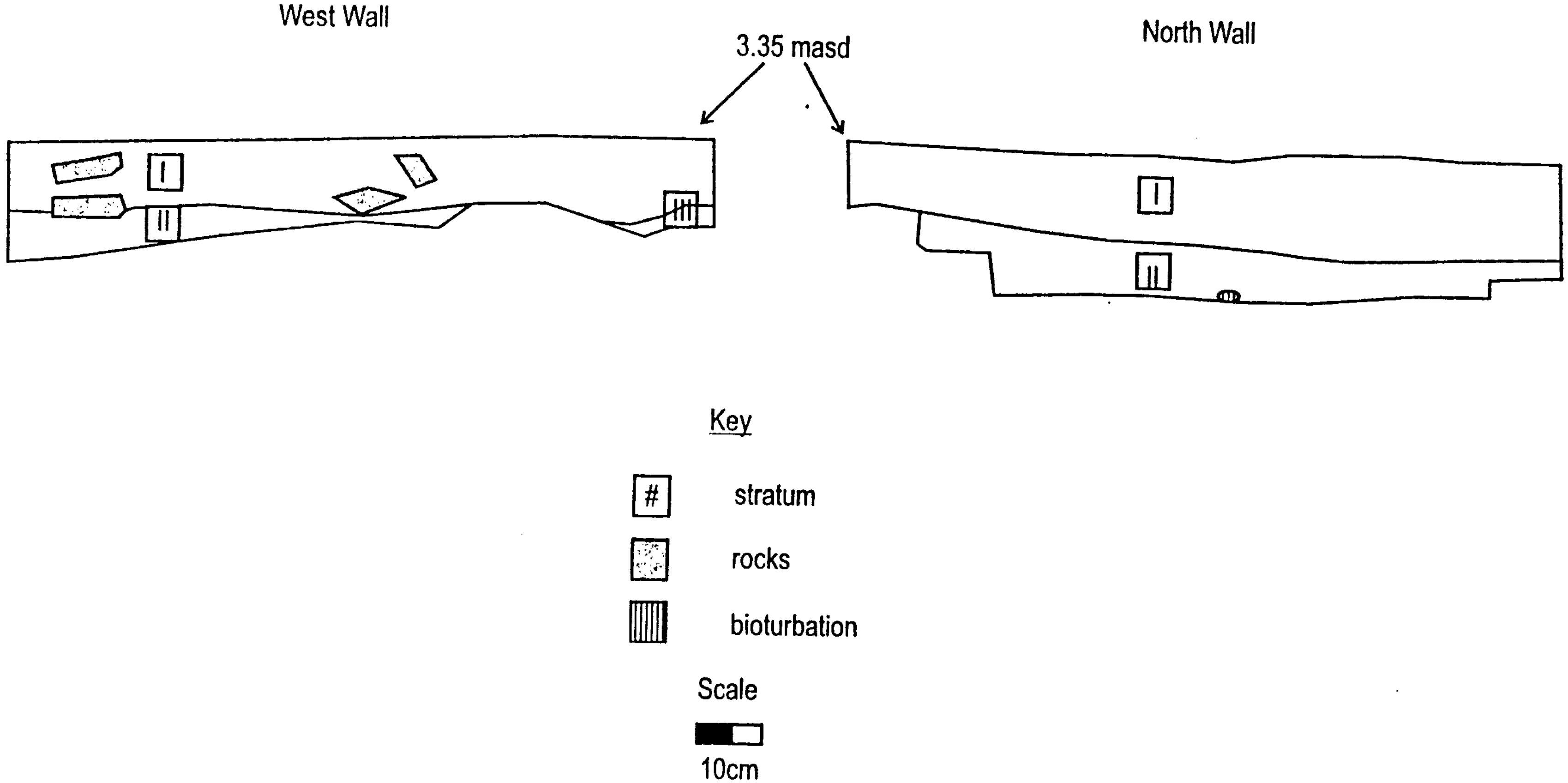


Figure 12.5. West-wall profile and north-wall profile, Test Unit 1, 5PE1803, FCMR.

account for 15% of the matrix. The sediments react violently to hydrochloric acid.

Stratum III Sandstone bedrock ® horizon). This stratum does not appear on the profile illustration. *Test Unit 2*

Test Unit 2

Test Unit 2 was placed in an open meadow toward the north-central end of the site near where shovel tests indicated a significant build-up of sediments and soil development as well as the potential presence of subsurface artifacts. This unit was excavated in three layers to a total depth of between 47.5 and 51.5 cm below the ground surface. The datum was placed in the northeast corner (166.29 mN, 62.20 mE, 4.80 masd), and the control sample was taken from this corner as well. The sod layer was thick because of the mat of prairie grasses. This layer continued to a depth of between 7 and 14 cm below the ground surface before a change was made to Layer 2. No artifacts were recovered from Layer 1. Layer 2 was identified as a reddish brown soil. It was excavated in two levels. Grass roots continued, and the number of gravels increased. Toward the end of Level 1/Layer 2, the grass roots ended and larger roots appeared. Level 2/Layer 2 continued with the same brownish sediments with larger shrub and tree roots. The small number of gravels were rounded and small with a few angular pebbles. Light charcoal flecking was noted during screening, although there was not enough to collect. A few artifacts were recovered from this level, and they were encrusted with calcium carbonate. A layer change was initiated between 25.5 and 28.5 cm below the ground surface when a tan, more compacted soil was encountered. Layer 3 was excavated in two levels. Gravels increased in number and in size with greater depth in the unit. The sediments became lighter in color, and calcium carbonate increased as well. No artifacts were recovered from this layer. Excavations were discontinued after 21 to 23 cm of excavation, and were stopped prior to encountering bedrock.

The north (south-facing) and the east (west-facing) wall profiles (Figure 12.6) were recorded, and the four strata identified in these profiles are described below.

Stratum I Stratum I is a thin (2 - 7 cm) layer of brown (10YR 5/3) subangular blocky silty sand. The lower boundary is gradual and smooth with the underlying stratum. Bioturbation is present in the form of grass roots. No artifacts were recovered from the stratum, which probably represents an A soil horizon. Small well-sorted gravels are present in the stratum. The silty sand matrix did not react to hydrochloric acid.

Stratum II Stratum II is a 9- to-12-cm-thick layer of brown to dark-brown (10YR

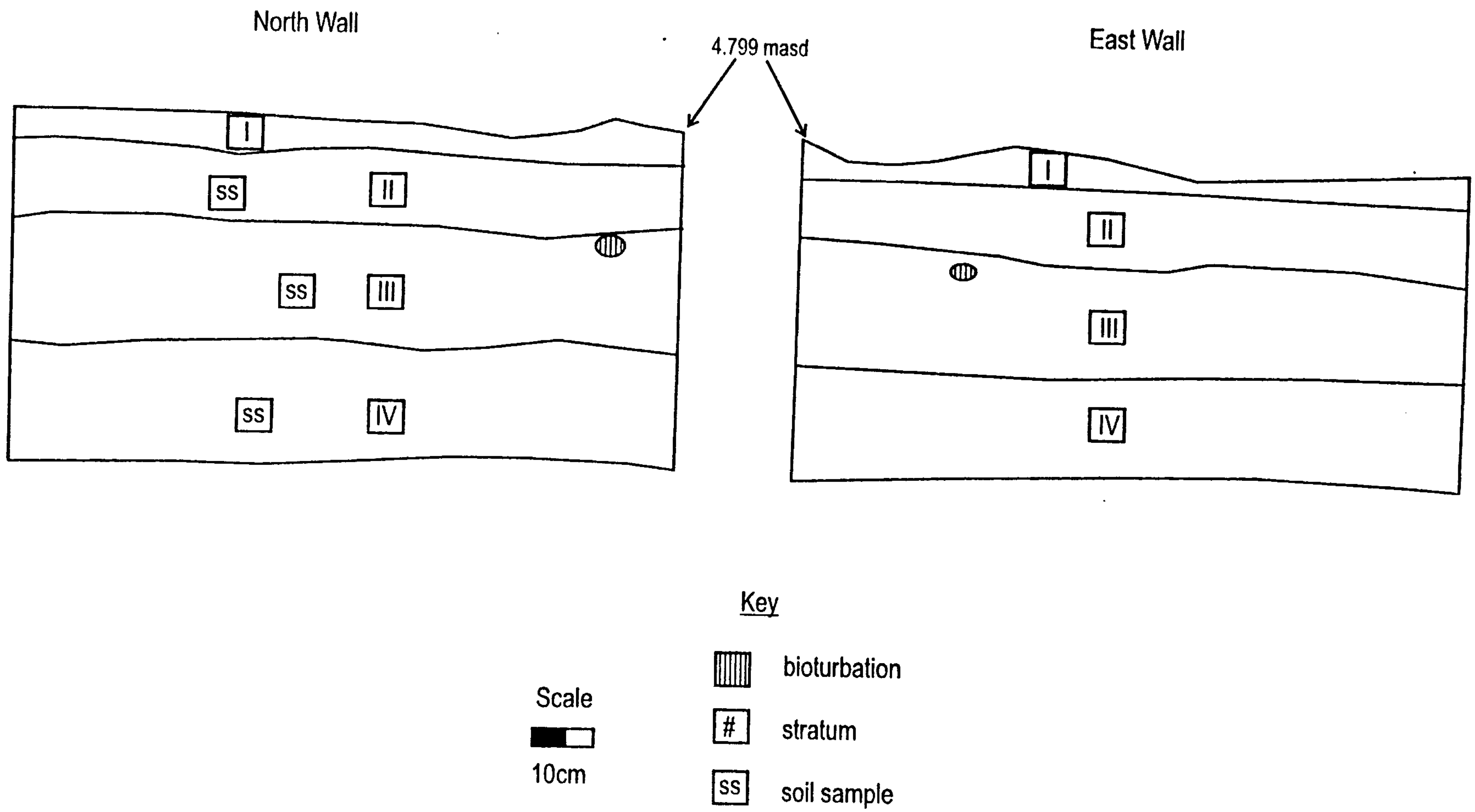


Figure 12.6. North-wall profile and east-wall profile, Test Unit 2, 5PE1803, FCMR.

4/3) loam. The soil structure is subangular blocky. The lower boundary is diffuse and smooth. Bioturbation (in the presence of roots) continues. Light charcoal flecking is present along with a few artifacts, that occur more toward the lower boundary. The sediments comprise medium, well-sorted sand and larger rounded gravels. The sediments react violently to hydrochloric acid. This stratum is most likely a B soil horizon

Stratum III — Stratum III is a brown to dark-brown (10YR 4/3) silt loam. The layer ranges between 14 and 20 cm thick. It possesses a subangular blocky soil structure. The lower boundary is gradual and smooth. Roots change from grass roots to larger tree and shrub roots. Gravels are present in this layer, which is slightly more compact than the previous stratum. The sediment grains are poorly sorted and range from fine sand to gravels. The sediments react violently to hydrochloric acid. There were no artifacts recovered from this stratum. The stratum likely represents a Bk soil horizon.

Stratum IV — Stratum IV is a thick (lower boundary concealed) layer of yellow (10YR 8/6) sandy clay loam. The soil structure is angular blocky and moderately well developed. The sediments are poorly sorted and range from medium sand to cobbles. The sandstone rocks increase in size in this layer. Sediments become more compact and calcium carbonate increases. The stratum may represent a continuation of the Bk soil horizon or a C soil horizon.

Test Unit 3

Test Unit 3 was located at the far western edge of the site in an area where a shovel test had produced subsurface artifacts. The unit was excavated in three layers to a total depth of between 30 and 34.5 cm below the ground surface. The datum was in the southwest corner (138.31 mN, 29.23 mE, 5.23 masd), and the control sample was collected from this corner as well. The sod layer was removed as Layer 1, which was no thicker than 3 cm. Layer 2 was a layer of dark-brown sediments that graded to reddish sediments. This distinction was not readily visible while excavating, and no layer change was initiated for the reddish layer. Artifacts, which included a core and two flake tools, were recovered from the reddish portion of Layer 2. Layer 2 was excavated in three levels to the contact with a lighter mottled layer with charcoal. This layer ended between 21 and 26.5 cm below the surface. Layer 3, which was harder to excavate with more compacted sediments, contained few roots and rocks but no artifacts. The layer was continued until a very light colored, heavy calcium carbonate layer was encountered. Excavations were terminated at this contact.

The west (east-facing) and the north (south-facing) wall profiles are illustrated (Figure 12.7). Four strata were recognized in these profiles. These strata are described below.

Stratum I — Stratum I is a brown (10YR 5/3) silt with sand. The soil structure is moderately developed and subangular blocky. The lower boundary is clear and smooth. There are few roots within the stratum and a small percentage (1%) of well-sorted gravel. Sediments do not react to hydrochloric acid. There were no artifacts in this thin (4 to 10 cm) A soil horizon.

Stratum II — Stratum II is a dark yellowish brown (10YR 3/4) loamy sand. The stratum ranges in thickness from 7 to 20 cm. The soil structure is moderately well developed and subangular blocky. The lower boundary is clear and wavy. Roots are present in the stratum as well as a small percentage (1%) of well-sorted gravels. There is no reaction to hydrochloric acid in this upper B soil horizon. Artifacts were present in this stratum; however, they were resting at different angles and were not on a horizontal plane.

Stratum III — Stratum III is a 9 to 18 cm thick layer of yellowish-brown (10YR 5/6) sandy loam with silt. The soil structure is moderately well developed and subangular blocky. The lower boundary is clear and smooth. There are a few roots in the stratum along with a small amount of charcoal and a slight increase (1% to 5%) in well-sorted gravels. Sediments react violently to hydrochloric acid. This stratum represents a Bk soil horizon.

Stratum IV — Stratum IV is a very pale brown (10YR 7/4) sandy loam with silt. The sediments are moderately well developed with subangular blocky peds. The lower boundary remains concealed. Calcium carbonate increases in the stratum and it reacts violently to hydrochloric acid. The percent of gravels increases to between 5% and 10%. This horizon represents a Bk soil horizon, and it predates the prehistoric occupation of the site.

Material Culture

A total of 199 artifacts comprises the assemblage. One hundred and fifty-nine flakes, one biface, five retouched flakes, five utilized flakes, two metates, and ten cores were observed on the surface. The metates, the surface cores, and the surface debitage were analyzed in the field. The biface and the flake tools were collected. The flakes analyzed represent a sample of the total surface assemblage, which is estimated to be over 300. Thirteen flakes, one retouched flake, one utilized flake, one core, and a drill were recovered from excavations. Quantitative information on the tools and cores is

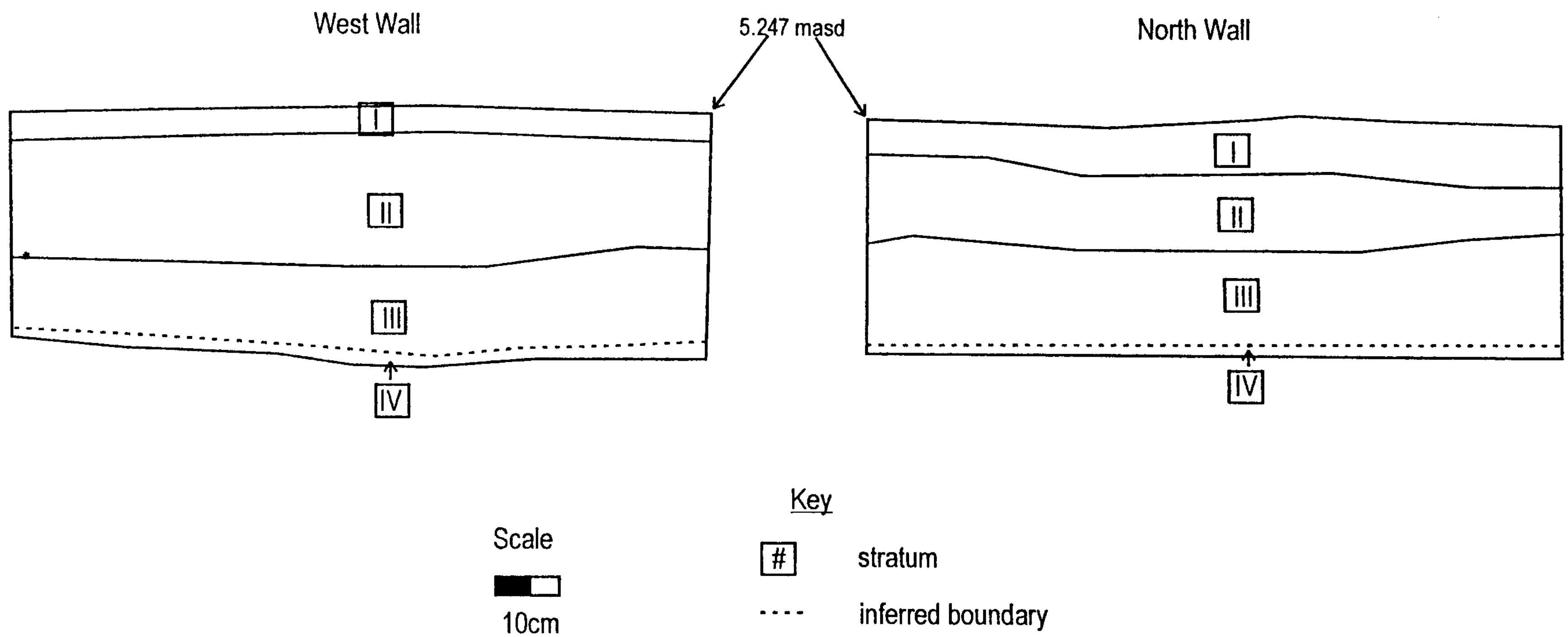


Figure 12.7. West-wall profile and north-wall profile, Test Unit 3, 5PE1803, FCMR.

presented in Appendix III and information on the two metates is provided in Appendix IV.

Flaked-Lithic artifacts

The biface is a large, unfinished, patterned tool in the early stage of manufacture. It is elongated and oval and made from locally procured orthoquartzite. One side exhibits more extensive thinning. The specimen is moderately thick and retains a small amount of cortex. The margins reveal a small amount of retouch flaking with no obvious signs of use wear. A drill (5PE1803.6a) was recovered from Shovel Test 35 (Figure 12.8). This artifact is manufactured from reddish brown chert. It has characteristics of a projectile point such as hafting, but is typed as a drill based on general shape and use the wear along the blade edges. The drill has a sharp tip, narrow blade, sloping shoulders, straight to slightly contracting stem element, concave base, and rounded tangs. One blade edge is straight, while the other edge is convex. In cross-section, the drill is bi-convex with a twisted appearance.

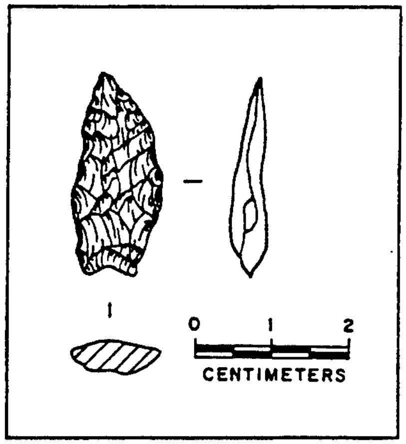


Figure 12.8. Drill 5PE1803.6a, FCMR.

A total of 12 unpatterned flake tools was analyzed. This total includes six utilized flakes and six retouched flakes. One retouched flake and one utilized flake were collected from Test Unit 3. The remaining five retouched flakes and five utilized flakes were found on the surface. Local raw materials were used to produce all of these flake tools, with chalcedony the most popular material type. The majority have no visible cortex. Five of the twelve tools are complete flakes and seven are broken flakes. Six of the twelve tools are utilized flakes with no evidence of retouching; three possess unimarginal use wear and three possess bimarginal use wear. Two of the retouched flakes have unimarginal retouching and no evidence of use wear. The remaining four retouched flakes exhibit both utilization and retouching. Three retouched flakes have unimarginal retouching and utilization. One retouched flake tool has bimarginal retouching and utilization. The majority of the flake tools are small, with only three larger than 1".

Eleven cores were analyzed. Ten were recorded in the field and one, recovered from subsurface testing, was collected. The subsurface core is a bidirectional orthoquartzite core. It is the largest and the only bidirectional core in the assemblage. Eight of the surface cores have multidirectional flaking and two have unidirectional flaking. Six multidirectional cores are manufactured from chalcedony and two are manufactured from chert. The unidirectional cores are manufactured from chalcedony

and orthoquartzite.

A total of 172 flakes was analyzed (Table 12.2). Data from the 13 subsurface flakes were combined with the data acquired from the 159 surface artifacts. Locally procured raw material types are present at the site, with chalcedony accounting for seventy percent of the assemblage. Simple and complex flake types occur with nearly equal frequency, with simple flakes slightly more common. Three out of every four flakes have no visible cortex. Medium-sized (½"-1") flakes account for half of all the flake sizes. The remainder of flakes are nearly evenly split between larger and smaller flakes.

These characteristics are suggestive of middle- to late-stage reduction activities. The prevalence of generally smaller flakes, the high number of complex flakes, and the small percentage of flakes with cortex support this conclusion. Inferences based on the Sullivan and Rozen (1985) system agree that core reduction was taking place (the high percentage of complete flakes). However, the percentage of flake fragments and broken flakes suggests that tool production may have been a slightly more common activity at the site than core reduction.

Groundstone

Two metates were noted on the site's surface. One was complete, while the other was a fragment. The complete specimen is made from a piece of tabular sandstone. The ground surface has slight pecking and moderate smoothing. The metate fragment consists of an unshaped piece of tabular sandstone. Based on the shape of the sandstone and what remains of the grinding surface, it appears that about two-thirds of the metate is missing. The grinding surface is lightly smoothed.

Summary and Conclusions

Subsurface testing at the site established that the bulk of the artifacts are confined to, or near, the surface. A drill and five flakes were recovered from four of the fifty-two shovel tests. Shovel Test 16 was placed in a surface concentration and produced two flakes from 10 to 20 cm below the ground surface. Sixteen shovel tests within 20 m of Test Unit 2 yielded two flakes. One of seven shovel tests in the vicinity of Test Unit 3 contained artifacts. The results from shovel testing narrowed the areas for test unit placement. The three test units produced a small number of artifacts. Six flakes were found in the first level of Test Unit 1. A charcoal sample was also collected from this level, but was not processed due to the presence of recently burned tree limbs in the

Table 12.2. Surface and subsurface non-tool flaked-lithic debitage, 5PE1803, FCMR.

Material	Quartzite/Orthoquartzite				Chert				Chalcedony				Total	
Type	S	SS	Subtotal	%	S	SS	Subtotal	%	S	SS	Subtotal	%	No.	%
Size Grade														
>1"	14	1	15		6	0	6		25	0	25		46	26.8
1/2" - 1"	5	1	6		15	1	16		61	2	63		85	49.4
<1/2"	0	0	0		7	3	10		26	5	31		41	23.8
Total	19	2	21	12.2	28	4	32	18.6	112	7	119	69.2	172	100
Flake Type (Ahler 1997)														
Shatter	0	0	0		1	0	1		2	1	3		4	2.3
Simple	12	1	13		10	1	11		65	4	69		93	54.1
Complex	7	1	8		17	3	20		45	2	47		75	43.6
Bifacial Thinning	0	0	0		0	0	0		0	0	0		0	0
Total	19	2	21	12.2	28	4	32	18.6	112	7	119	69.2	172	100
Cortex														
Present	6	2	8		7	0	7		25	4	29		44	25.6
Absent	13	0	13		21	4	25		87	3	90		128	74.4
Total	19	2	21	12.2	28	4	32	18.6	112	7	119	69.2	172	100
Flake Type (Sullivan and Rozen 1985)														
Complete	12	2	14		5	0	5		48	5	53		72	41.9
Broken	6	0	6		14	1	15		37	0	37		58	33.7
Flake Fragment	1	0	1		8	3	11		25	1	26		38	22.1
Debris	0	0	0		1	0	1		2	1	3		4	2.3
Total	19	2	21	12.2	28	4	32	18.6	112	7	119	69.2	172	100

S Surface
SS Subsurface

immediate area. Test Unit 2 produced two flakes between 15 and 28 cm below the ground surface, which is the transition between Strata II and III. Test Unit 3 had two flake tools and a core within 8 to 18 cm below the ground surface, which places them in Stratum II. The core and one of the flake tools were found *in situ*. Both artifacts were found resting at angles suggesting that these artifacts were not in their original context and may represent a secondary context. Control samples for all three test units yielded one flake, which was found in the initial level of Test Unit 1. This flake would have been retained in the conventional ¼" mesh. The absence of small debitage in the control samples suggests that smaller flake types such as thinning or resharpening flakes are rare occurrences. The low number of formal tools and the number of expedient tool forms indicate that tool production activities, if present, were limited.

Despite the large number of artifacts, there is little diversity within the overall artifact assemblage. The presence of numerous cores indicates that the site was clearly a focus of core reduction activities where local raw materials were being reduced. The number of artifacts suggest that the site was occupied for an extended period of time or was repeatedly visited over time. The presence of metates suggests that food processing occurred at the site. No diagnostics artifacts have been identified at the site; therefore, the temporal period remains inconclusive. The lack of a buried cultural horizon and the shallow depth of buried artifacts indicates little potential for significant cultural deposits. This site is not recommended as eligible for nomination to the NRHP because so little can be understood about it that it is not possible to determine if specific important research questions can be answered by data contained in the property.

CHAPTER13
5PE1804

Introduction

Site 5PE1804, a small prehistoric open site lacking features, was originally recorded by FLC during the 1995 inventory of portions of Booth Mountain (Charles et al. 1997:6.55-56). Twelve flakes and flaking debris, three core fragments, one scraper, and one groundstone fragment were mapped and analyzed from the surface. Lithic raw material types included chert, chalcedony, and quartzite. The large number of pieces of debris implied that intensive core reduction was the primary activity at the site. This conclusion was strengthened by the presence of two quartzite core fragments and one chert core fragment. Most of the artifacts were located in a small circular area upslope from exposed bedrock. Temporally diagnostic artifacts were not observed at the site. It is likely that the site represents a locus of prehistoric food processing and core reduction. The depth of the sediments at the site suggested the possibility for buried archeological deposits.

It was recommended that the site was eligible for nomination to the NRHP. This evaluation was based on the potential for the site to yield buried deposits, and the potential for the site to address the research themes of settlement and economics for prehistoric sites on the FCMR (Zier et al. 1987).

The site is on the east side of a narrow bench along the north slope of Booth Mountain (Timber Mountain, U.S.G.S. 7.5' quadrangle [Figure 13.1]). The site is characterized by a flaked-lithic artifact scatter encompassing an area of 234 m^2. The majority of artifacts are exposed in a small open grassy area surrounded by trees. It is at an elevation of 5,940 ft (1,811 m) asl, with an aspect to the north. The slope at the site ranges from 1° to 3° and becomes steeper downslope. Sediments accumulate at the site through slope wash of the weathered bedrock. Eolian accumulations most likely form a small portion of the total matrix as well. Pinyon, juniper, various grasses, narrow-leaf yucca, mountain mahogany, snakeweed, and cacti grow on the site and in the general site vicinity (Figure 13.2). The closest water source is an unnamed ephemeral drainage that begins on the south edge of the site. A larger drainage is located about 60 m west of the site. This drainage is deeply dissected and may have been present during prehistoric occupation. Water in the drainage is seasonal and is collected through stormflow and interflow. The site has witnessed some light impacts from slope wash erosion. A boulder outcrop is directly east of the site on the edge of the bench.

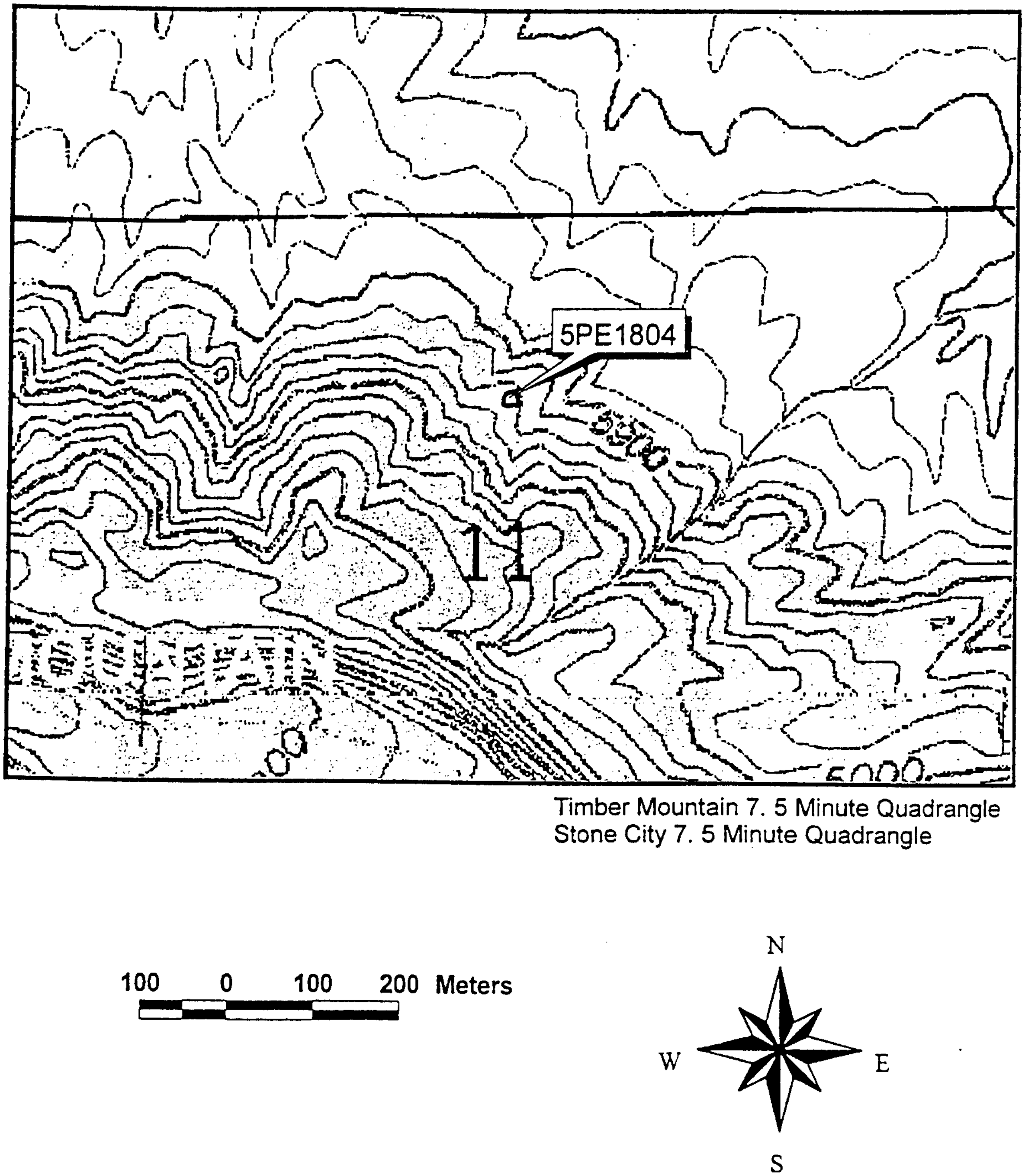


Figure 13.1. Location map, 5PE1804, FCMR.

Figure 13.2. Overview of site from above, 5PE1804, FCMR. View is to the northwest.

Surface Investigations

Surface investigations began by walking transects across the site. A total of thirty-four flakes and one scraper were mapped on the surface using a Total Station (Figure 13.3). The flakes were analyzed in the field, and the scraper was collected for further analysis. The cores and the groundstone fragment noted in the original recording were not relocated. Three flaked-lithic artifacts were originally recorded on a lower bench about 20 m northeast of the main site area. The surface inventory failed to locate artifacts in this area.

Subsurface Investigations

Subsurface testing consisted of excavating fifteen shovel tests and a single test unit.

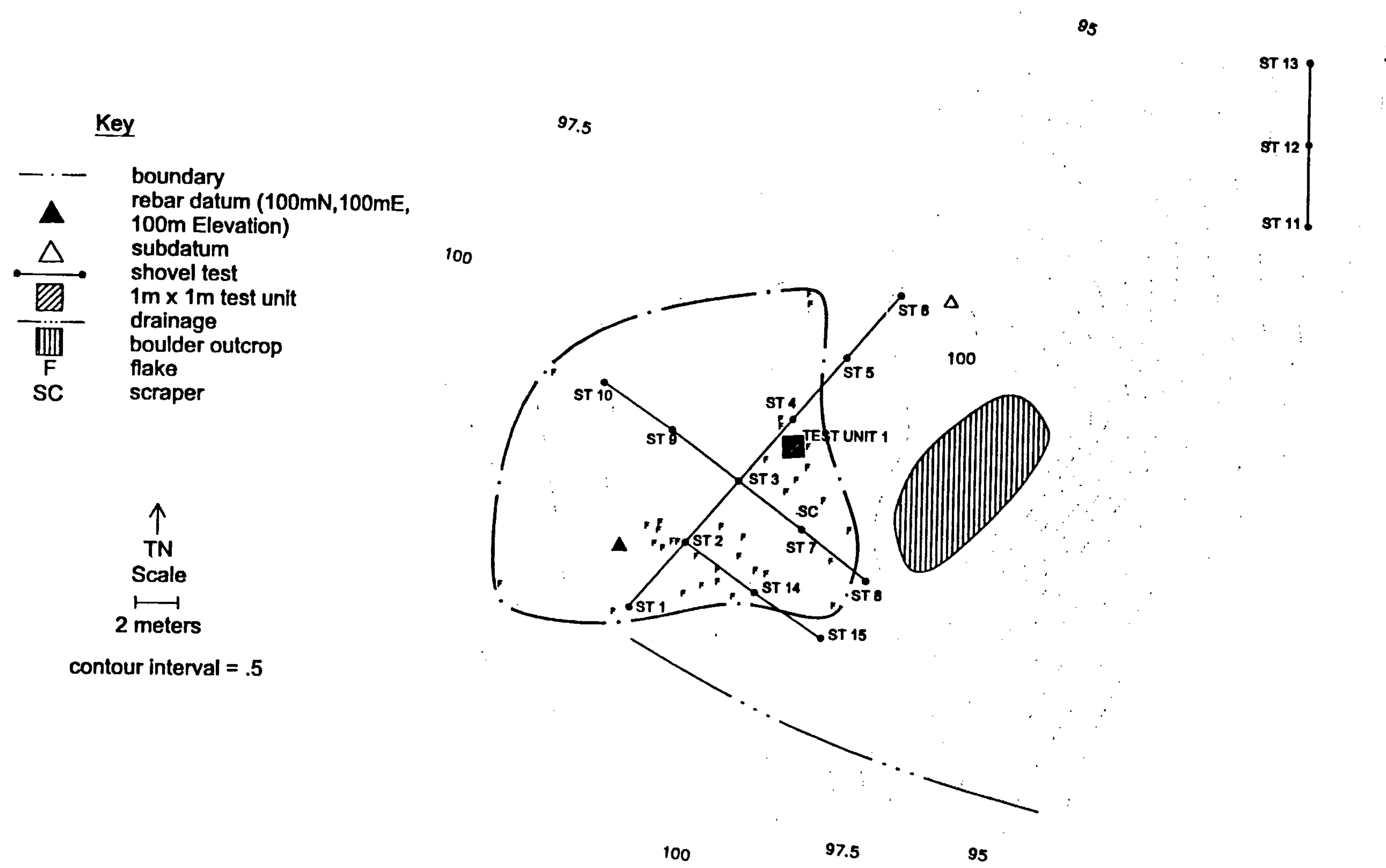


Figure 13.3. Site map, 5PE1804, FCMR.

Shovel Tests

Fifteen shovel tests were excavated at this site. Shovel tests were placed a distance of 4 meters apart. The shovel tests were excavated to culturally sterile sediments, to bedrock, or until the test hole could no longer be excavated with the available equipment (~70 cm). The first shovel test line extended in a northeast to southwest direction across the central portion of the site and within the artifact concentration. Six shovel tests were excavated along this line, none of which contained artifacts. A second shovel test line was placed perpendicular to the first line, intersecting at Shovel Test 3. Four shovel tests were excavated in this line. None of these contained artifacts. A third line was placed perpendicular to the first line and intersected at Shovel Test 2. Two shovel tests were excavated in this line. One of these produced a single artifact. A fourth shovel test line was placed in a small open area below the main artifact concentration in the area where a few artifacts had been previously recorded. Three shovel tests were excavated here, none of which produced buried artifacts. Detailed stratigraphic descriptions of the shovel tests are presented in Appendix II.

Test Unit

Due to the small site size and the lack of artifacts recovered during shovel testing, a single test unit was excavated at this site. This test unit was placed within the main artifact concentration. Test unit results are summarized in Table 13.1.

Table 13.1. Test unit summary, 5PE1804, FCMR.

Test Unit No.	Layer	Level	Thickness Range (bgs)	Materials Recovered 1/4"	1/16" Control
1	1	*	1-4 cm	2 flaked-lithic artifacts	No control sample
1	2	*	3-9 cm	3 flaked-lithic artifacts	2 flaked-lithic artifacts, charcoal
1	3	1	10.5-14.5 cm	None	None
1	3	2	10-15 cm	None	None
1	3	3	10-13 cm	None	None
1	3	4	10 cm	None	None

* Excavated as a single stratigraphic layer

Test Unit 1

Test Unit 1 was excavated in three layers to a final depth of between 53 and 54 cm below the ground surface. The datum was placed in the northwest corner (105.50 mN, 10.97 mE, 0.325 mbsd), while the control sample was taken from the northeast corner. The sod layer was removed as Layer 1. This layer contained a few flaked-lithic artifacts and consisted of a fine sand with silt and pebbles. The layer was excavated for a depth of between 1 and 4 cm below the ground surface. Layer 2 was excavated as a single layer (3 to 9 cm thick)that produced a few artifacts in a fine sand with silt matrix. Bioturbation, coarse sand, and pebbles were encountered in the layer, which was discontinued when a tan silty loam was encountered. The final layer, Layer 3, was excavated in four levels. No artifacts were recovered. Roots and pebbles continued in the layer with scant charcoal. Cobbles began to appear at the top of the layer, and these continued throughout the excavation. After 33 to 35 cm had been excavated in Layer 3 without recovering any artifacts, excavations were terminated

The west (east-facing) and the north (south-facing) wall profiles are illustrated in Figure 13. 4. Four strata were recognized and described in the profile walls. The strata descriptions follow.

Stratum I — Stratum I is a 1-to-8-cm-thick sod layer. It is composed of dark brown (10YR 3/3) fine sand with silt. The pedogenic structure is moderately developed and subangular blocky. The lower boundary is undulating and clear. Grass roots, artifacts, and coarse sand and pebbles (5% to 10%) are present in the stratum. There is a moderate reaction to hydrochloric acid. The gravel is mostly composed of decomposing sandstone. This stratum is the A soil horizon with calcium carbonate.

Stratum II — Stratum II is a dark-brown (10YR 4/3) loamy sand. It is between 3 and 12 cm thick with a clear and undulating lower boundary. Pedogenic structure is moderately well developed with subangular blocky peds. Grass roots and artifacts are present in the stratum. Sandstone gravels remain consistent throughout the stratum, which reacts violently to hydrochloric acid. This stratum is a Bk soil horizon.

Stratum III — Stratum III is a yellowish-brown (10YR 5/6) sand. The stratum is between 30 and 35 cm thick. The soil structure is well developed with subangular blocky peds. The lower boundary is diffuse and irregular. The sediments react violently to hydrochloric acid. There are tree roots, gravels (5% - 10%), and some large cobbles present in the stratum. Artifacts were not recovered from this Bk soil horizon.

Stratum IV — Stratum IV is a brownish-yellow (10YR 6/6) loamy sand. The peds are

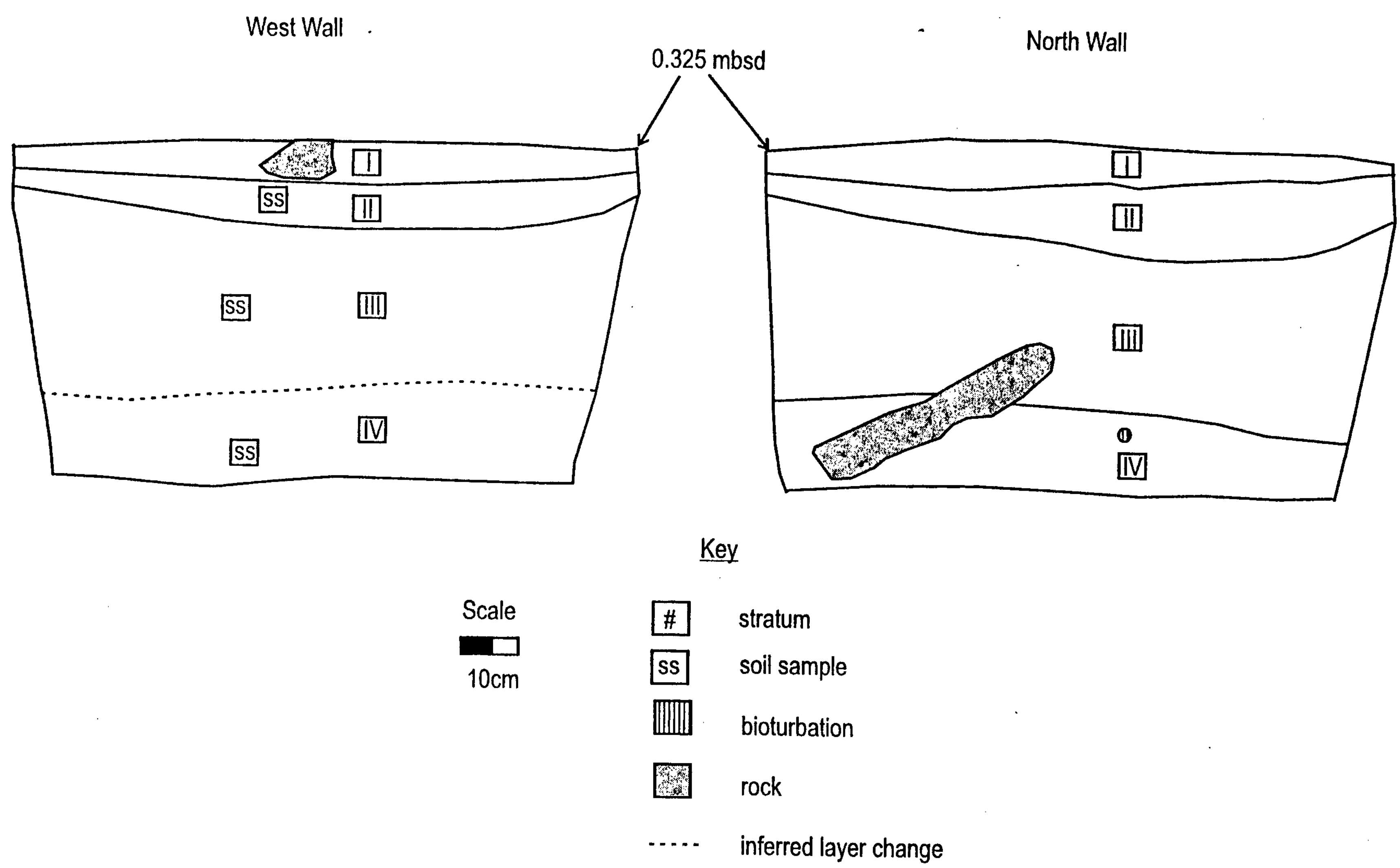


Figure 13. 4. West-wall profile and north-wall profile, Test Unit 1, 5PE1804, FCMR.

well developed and subangular blocky. The lower boundary remains concealed. Roots, pebbles, sandstone gravels (5% - 10%), and a few larger pieces of sandstone occur in the layer. The stratum reacts very violently to hydrochloric acid. Artifacts were not noted in this calcic B soil horizon.

Material Culture

A total of 43 artifacts comprises the flaked-lithic assemblage. Thirty-four non-tool flaked-lithic artifacts and one scraper were located on the surface. The flakes were analyzed in the field, and the scraper was collected for further analysis. More artifacts were located on the surface during testing than when the site was originally recorded. A total of eight artifacts was recovered from subsurface investigations. Seven flakes were recovered from Test Unit 1, and one flake was recovered from Shovel Test 14. Quantitative information on the scraper is presented in Appendix III.

Flaked-Lithic artifacts

The scraper is manufactured from reddish brown chert. Patterned unifacial flaking is evident along one margin of the triangular-shaped complete flake. There is evidence of unifacial use wear along the modified edge.

Analysis of the information gathered on the non-tool flaked-lithic artifacts is limited by the presence of only 42 artifacts. Subsurface artifact data are combined with the information gathered on the surface artifacts (Table 13.2). Local raw material sources were utilized extensively at the site, with orthquartzite accounting for nearly half of the assemblage. Simple flakes are the most common flake type, and a high percentage of these exhibit cortex. Nearly half of the flakes are larger than one inch in size, and together with the next larger category (½" to 1") they account for 90% of the total assemblage.

These flaking characteristics are suggestive of early- to middle-stage reduction activities. The high number of large simple flakes with cortex supports this interpretation. Results from the Sullivan and Rozen (1985) classificatory system agree that core reduction was the prevalent site activity. This interpretation is based on the large number of complete flakes. However, the percentage of flake fragments and broken flakes implies that tool production was also undertaken at the site.

Table 13.2. Surface and subsurface non-tool flaked-lithic debitage, 5PE1804, FCMR.

Material	Quartzite/Orthoquartzite				Chert				Chalcedony				Total	
Type	S	SS	Subtotal	%	S	SS	Subtotal	%	S	SS	Subtotal	%	No.	%
Size Grade														
>1"	10	1	11		7	0	7		2	0	2		20	47.6
1/2" - 1"	5	4	9		5	1	6		2	0	2		17	40.5
<1/2"	0	0	0		1	0	1		2	2	4		5	11.9
Total	15	5	20	47.6	13	1	14	33.3	6	2	8	19.1	42	100
Flake Type (Ahler 1997)														
Shatter	0	0	0		4	1	5		0	0	0		5	11.9
Simple	11	5	16		0	0	0		5	2	7		23	54.8
Complex	4	0	4		9	0	9		1	0	1		14	33.3
Bifacial Thinning	0	0	0		0	0	0		0	0	0		0	0
Total	15	5	20	47.6	13	1	14	33.3	6	2	8	19.1	42	100
Cortex														
Present	12	3	15		11	1	12		3	1	4		31	73.8
Absent	3	2	5		2	0	2		3	1	4		11	26.2
Total	15	5	20	47.6	13	1	14	33.3	6	2	8	19.1	42	100
Flake Type (Sullivan and Rozen 1985)														
Complete	11	2	13		2	0	2		2	0	2		17	40.5
Broken	2	2	4		5	0	5		1	0	1		10	23.8
Flake Fragment	2	1	3		2	0	2		3	2	5		10	23.8
Debris	0	0	0		4	1	5		0	0	0		5	11.9
Total	15	5	20	47.6	13	1	14	33.3	6	2	8	19.1	42	100

S Surface
SS Subsurface

Summary and Conclusions

The small number of artifacts and the lack of variety within the artifact assemblage indicate that the site was occupied for a short time. Subsurface testing at the site shows that the artifacts are limited to surface or near-surface contexts. The first 6 to 10 cm below the ground surface in the test unit yielded a total of seven flaked- lithic artifacts. The first layer, the sod, produced two flakes. The following layer produced a small amount of charcoal and five flakes, with two of these recovered from the control sample. One of the artifacts recovered from the control sample may have fallen through the conventional ¼" mesh. The next four levels in Layer 3, including the control samples, were culturally sterile. One shovel test contained one flake at a depth of between 0 and 10 cm below ground surface. A single charcoal sample was collected, but it was not analyzed due to the small sample size, lack of diagnostic artifacts, and the low potential for buried cultural deposits from the site. Therefore, the date of the site remains inconclusive. A lack of substantial subsurface cultural deposits or features along the relatively small number of artifacts presupposes that the site has little potential to yield significant archeological information. The site is therefore not recommended as eligible to the NRHP because so little can be understood about it that it is not possible to determine if specific important research questions can be answered by data contained in the property.

CHAPTER 14
5PE1805

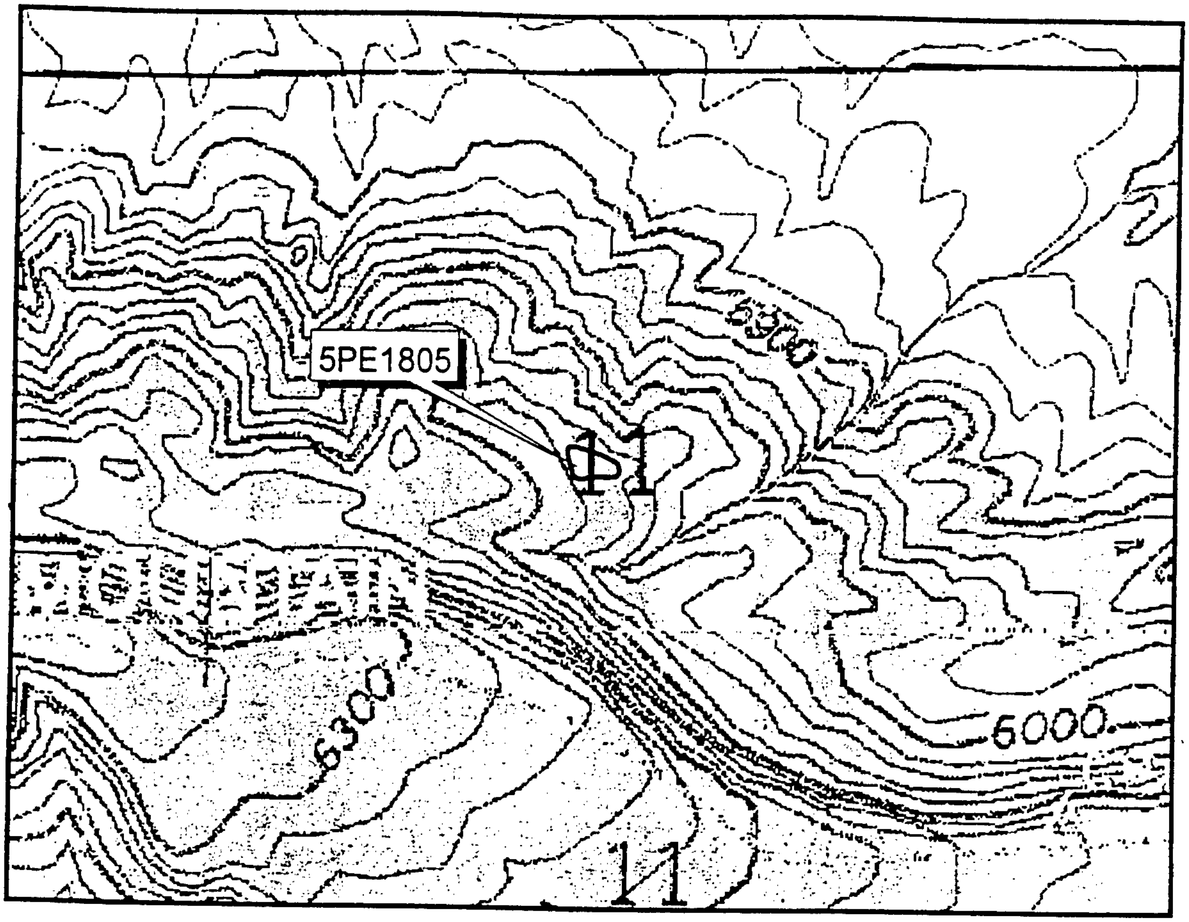
Introduction

Site 5PE1805 is a small (1,140 m²) prehistoric open site lacking features. It was originally recorded by FLC during the 1995 inventory of portions of Booth Mountain (Charles et al. 1997:6.56-59). The site consists of a scatter of flaked-lithic debitage and cores concentrated in a small open area within a pinyon and juniper woodland. Over 150 chalcedony and quartzite artifacts were observed at the site. A sample of these was analyzed in a 1-x-20-m transect through a portion of the site. The flaked-lithic assemblage and the presence of several cores suggested that tool manufacture and some unintensive core reduction were the major activities conducted at the site. Diagnostic artifacts were not observed at the site; therefore, the temporal affiliation remained inconclusive. Sediment depth was assumed adequate for archeological deposits to be buried. The site was recommended eligible for nomination to the NRHP because of the potential for the site to yield buried deposits and the potential for the site to address the research themes of settlement and economies for prehistoric sites on the FCMR(Zier et al. 1987).

The site is located along a narrow bench on the north slope of Booth Mountain(Timber Mountain, U.S.G.S. 7.5' quadrangle [Figure 14.1]). It is at an elevation of 6,080 ft (1,853 m) asl with an aspect from the site to the north. The slope at the site ranges between 1° and 2°. Most of the site matrix consists of sand and conglomerate pebbles that eroded from the exposed sandstone bedrock. The sediments accumulate at the site through slope-wash processes. Some residual weathering and eolian accumulations most likely form a small portion of the total matrix. Pinyon, juniper, narrow-leaf yucca, snakeweed, skunkbush, mountain mahogany, cacti, and various grasses grow on the site as well as in the general site area. Dead fall trees dot the site. Sandstone boulders outcrop along and near the edge of the bench. Small sandstone gravels are scattered over the surface, and they are more dense in areas where the slope is greater. The bench drops off steeply to the north and east (Figure 14.2). The closest water sources are small ephemeral drainages that dissect the site from southwest to northeast. Currently these gullies are eroding sediments from the site.

Surface Investigations

A surface inventory was accomplished through a series of transects. All artifacts were pin-flagged. One hundred and sixty flakes were analyzed in the field along with



Timber Mountain 7. 5 Minute Quadrangle
Stone City 7. 5 Minute Quadrangle

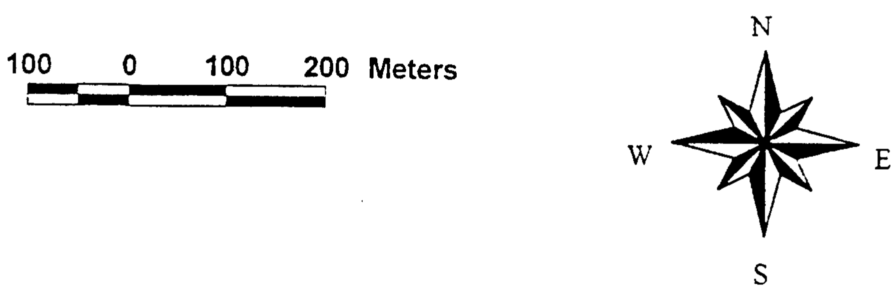


Figure 14.1. Location map, 5PE1805, FCMR.

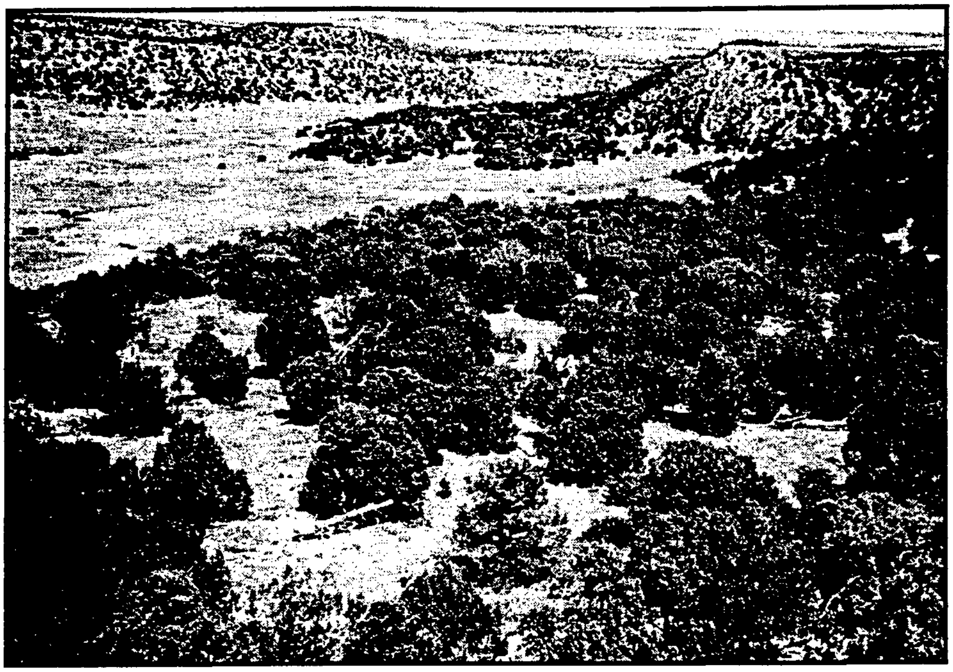


Figure 14.2. Site overview, 5PE1805, FCMR. View is to the east–northeast.

seven cores. Six tools were collected for further analysis. These tools include two utilized flakes, two hammerstones, one projectile point, and one graver. After determining the site boundary, survey points were taken with a Total Station, and a site map was generated (Figure 14.3).

Subsurface Investigations

Twenty-five shovel tests and two test units were excavated at the site.

Shovel Tests

Twenty-five shovel tests were excavated in three lines crossing the site's length and width. Shovel tests were placed a distance of four meters apart. The shovel tests were excavated to culturally sterile sediments, to bedrock, or until the test hole could no longer be excavated with the available equipment (~70 cm). Four of the twenty-five (16%) shovel tests recovered artifacts. The first line paralleled the southern edge of the site south of the main artifact concentration. Fourteen shovel tests were excavated along this line, one of which produced artifacts. A second line was placed perpendicular to the first line intersecting at Shovel Test 6. Eight shovel tests were excavated along

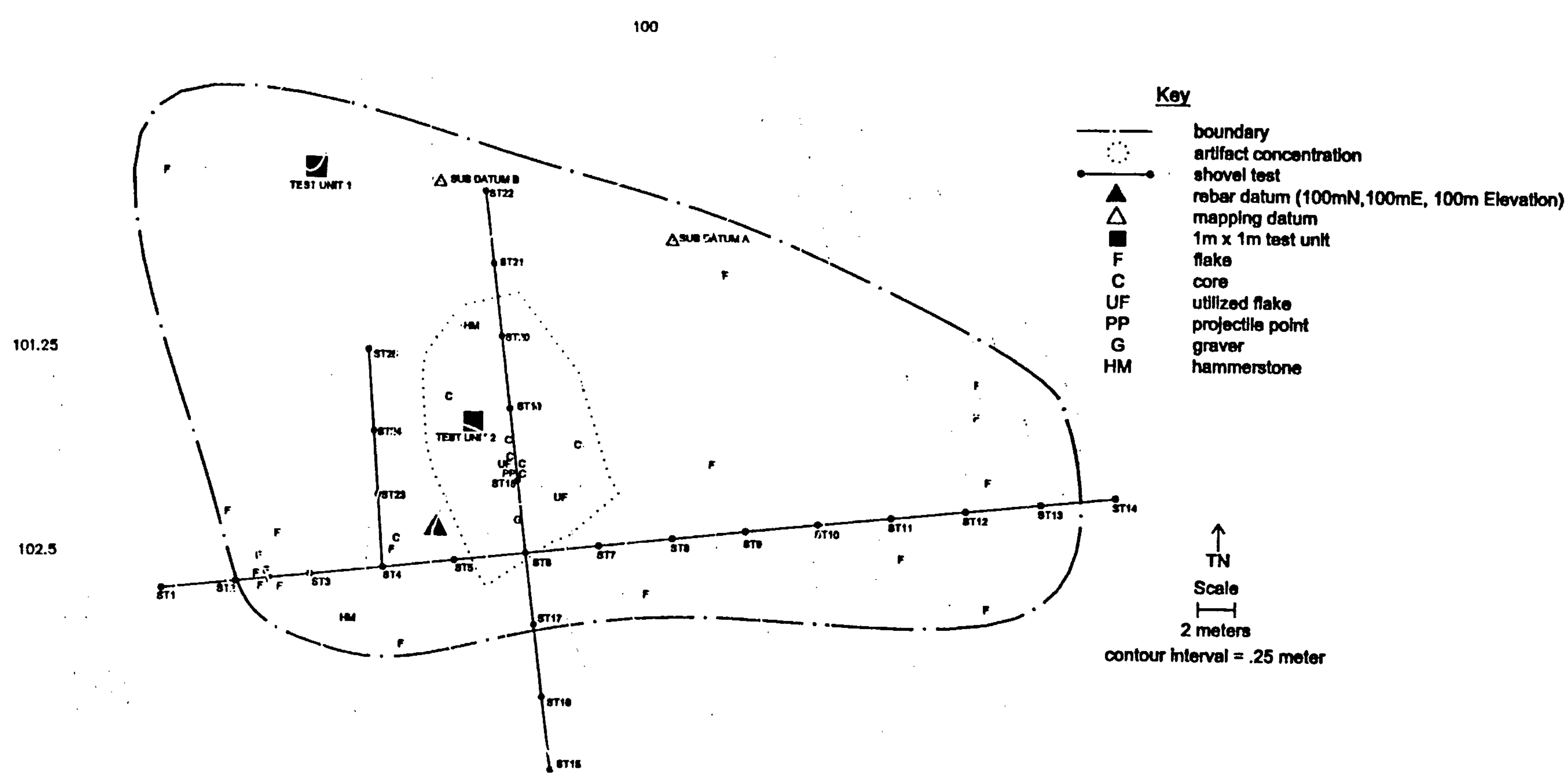


Figure 14.3. Site map, 5PE1805, FCMR.

this line; three of the eight produced artifacts. A third shovel test line was placed perpendicular to the first line and intersected at Shovel Test 4. Three shovel tests were excavated along this line. No artifacts were recovered from this shovel test line. Stratigraphic descriptions of the shovel tests are provided in Appendix II.

Test Units

Test Unit 1 was located in the northwestern quarter of the site where sediment build-up was deemed sufficient to cover buried archeological deposits. Test Unit 2 was positioned near the middle of the site and within the heaviest artifact concentration. Test unit results are summarized in Table 14.1.

Table 14.1. Test unit summaries, 5PE1805, FCMR.

Test Unit No.	Layer	Level	Thickness Range (bgs)	Materials Recovered 1/4"	1/16" Control
1	1	*	1-3 cm	None	No control sample
1	2	1	4-10 cm	None	None
1	2	2	10 cm	None	None
1	2	3	10-12 cm	None	None
1	2	4	9-11 cm	None	None
1	2	5	8-10 cm	None	None
2	1	*	1.5-7.5 cm	4 flaked-lithic artifacts, 1 core fragment	No control sample
2	2	1	0-9 cm	10 flaked-lithic artifacts, 3 cores	None
2	2	2	8-10 cm	1 flaked-lithic artifact, 1 ^{14}C sample	2 flaked-lithic artifacts, snail shell, 2 rodent bone
2	2	3	10 cm	None	Seed
2	2	4	10 cm	1 flaked-lithic artifact	None

* Excavated as a single stratigraphic layer.

Test Unit 1

Test Unit 1 was excavated in two layers to a final depth of between 45 and 52 cm below the ground surface. The datum was located in the northwest corner (120.25 mN, 92.81 mE, 0.522 masd) where the control sample was collected as well. Layer 1, the sod layer, was excavated as a single stratigraphic layer, which ranged from 1 to 3 cm thick. A layer change was initiated when the sediments became reddish brown with more pebbles and cobbles. Roots continued in Layer 2 similar to that in Layer 1. Five levels were excavated in Layer 2. Sediments continued to be a reddish brown loam with an increase in calcium carbonate accompanied by a greater compactness with depth in the test unit. A large, angular sandstone rock was present in the lowest level. No artifacts were recovered from this unit, and excavations were terminated after six culturally sterile levels had been excavated. A stratigraphic break in Layer 2 was not noticed during excavation, but was apparent in the profile walls.

Three strata appear in the west (east-facing) and in the north (south-facing) wall profiles (Figure 14.4). These strata are described below.

Stratum I — Stratum I is a thin (4 - 8 cm) layer of yellowish brown (10YR 5/4) fine sand with silt. The soil structure is weak to granular and subangular blocky. The lower boundary is gradual and smooth. Gravels are predominately composed of weathered sandstone, and they account for about 1% of the matrix. Calcium carbonate is present but light. This stratum represents a thin A soil horizon.

Stratum II — Stratum II is a brown to yellowish brown (10YR 5/4 to 5/3) sandy loam. The soil structure is subangular blocky and moderately developed. There is less sand than in Stratum I. The lower boundary is gradual and smooth. Calcium carbonate increases and sediments react violently to hydrochloric acid. Gravels are predominately composed of weathered sandstone, which account for about 1% of the matrix. The layer is between 8 and 20 cm thick. Bioturbation consists of roots, which continue from Stratum I. Stratum II is a Bk soil horizon.

Stratum III — Stratum III was divided into two substrata.

Stratum IIIa is a 2-to-2-cm-thick layer of brown (10YR 5/3) silt loam with some sand. The soil structure is subangular blocky and moderately developed. The lower boundary is gradual to undulating and smooth. Decomposing sandstone increases and accounts for between 1% and 5% of the matrix. Roots continue throughout this stratum. Calcium carbonate increases from the stratum above. Sediments react violently to hydrochloric acid.

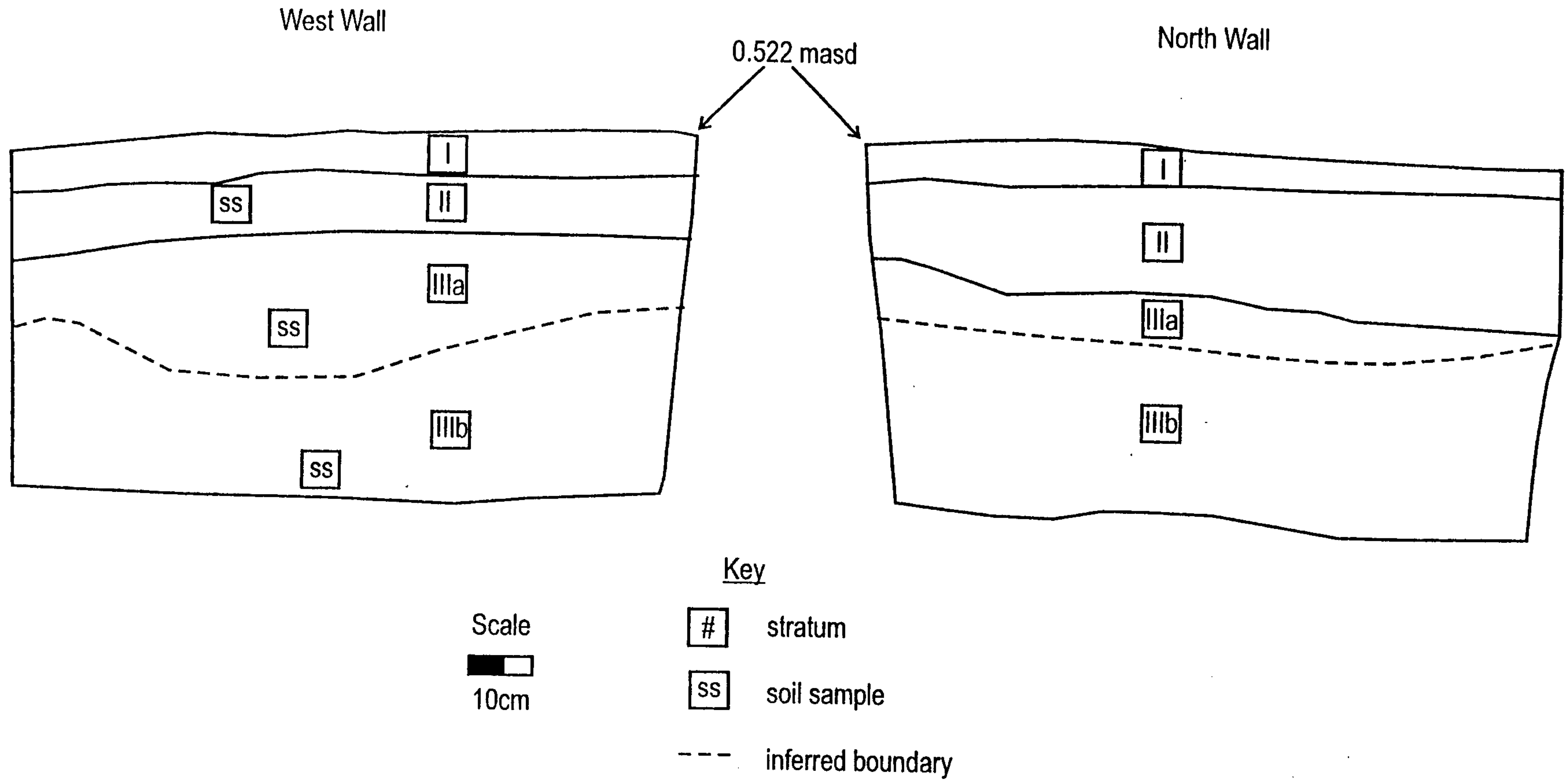


Figure 14.4. West-wall profile and north-wall profile, Test Unit 1, 5PE1805, FCMR.

Stratum IIIb is a brown (10YR 5/3) silty loam with subangular blocky, moderately developed peds. Bioturbation has decreased from Stratum IIIa and there is a slight color change to a lighter brown, and sediments are more compacted. Sediments react violently to hydrochloric acid. Gravels make up between 1% and 5% of the matrix. The lower boundary is concealed. Stratum III is a cambic (Bk) soil horizon.

Test Unit 2

Test Unit 2 was placed in the artifact concentration and was excavated in two layers. The maximum depth range of the unit was between 29.5 and 46.5 cm below the ground surface. The datum was located in the southwest corner (105.30 mN, 101.58 mE, 0.082 masd), as was the control unit. Layer 1, the sod layer, ranged in thickness from 1.5 to 7.5 cm. On the surface of the unit were grasses and cholla. Sediments consisted of dark-brown fine sand. Four flakes and a core fragment were recovered from Layer 1. A layer change was introduced at the bottom of the sod and at the position where sediments became more compacted. Layer 2 was excavated in four levels in a compacted silty loam. Small and large roots and insect krotovina continued in Layer 2. Ten flaked-lithic artifacts and three cores were recovered from Level 1/Layer 2. Charcoal was present, but its source was suspect because of the ubiquitous bioturbation. A single flaked-lithic artifact was recovered during excavation, and two additional flakes were recovered in the waterscreened control sample. Level 3/Layer 2 was compact with numerous instances of bioturbation. Artifacts were not recovered in this level. Level 4/Layer 2 was hard and compact with roots and insect krotovina. Locust larvae were common in the level. A few flecks of charcoal were present in the level, and a single flake was recovered during excavation. Excavations were terminated at the contact of the sediments with a heavy calcium carbonate layer. Results from shovel testing had demonstrated that the calcium carbonate layer was culturally sterile.

Three strata were identified in the west (east-facing) and in the north (south-facing) wall profiles (Figure 14.5). These strata are described below.

Stratum I — Stratum I is a dark-brown (10YR 4/3) fine sand. The soil structure is weakly developed and fairly massive. The lower boundary is clear and smooth. Roots, rock, pine needles, and cholla occur within the stratum. Gravels consist of well-sorted decomposing sandstone, which accounts for about 1% of the total matrix. Artifacts occur in this 1-to-10-cm-thick stratum. The stratum represents a recent A soil horizon with a minor amount of calcium carbonate.

Stratum II — Stratum II is a reddish brown (5YR 4/4) fine silt loam. The soil

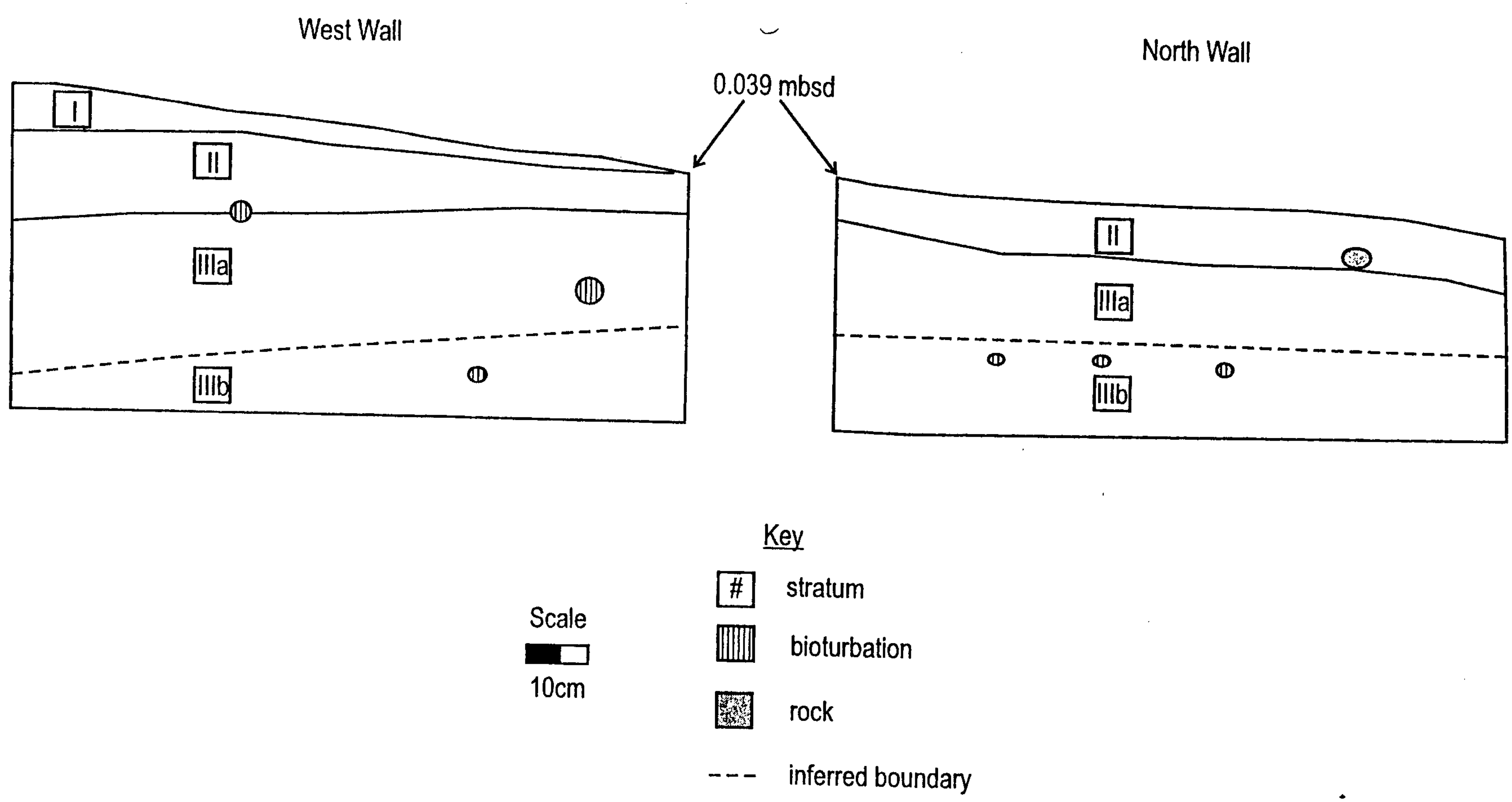


Figure 14.5. West-wall profile and north-wall profile, Test Unit 2, 5PE1805, FCMR.

structure is angular blocky and moderately developed. The lower boundary is gradual and wavy. There is a slight reaction of the sediments to hydrochloric acid. Decomposing sandstone gravels are well sorted and make up about 1% of the sediment matrix. Artifacts are present in this 6-to-13-cm-thick stratum, which is the upper portion of a B soil horizon.

Stratum III — Stratum III was divided into two substrata, Stratum IIIa and Stratum IIIb. The division was made because of the increase in calcium carbonate deeper in the stratum. The stratum is a yellowish red (5YR 5/6) silt loam. Stratum IIIa is angular blocky and well developed. The stratum thickness ranges from 11 to 21 cm. There is a moderate reaction to hydrochloric acid. Roots, charcoal, insect krotovina, and locust larvae are present in the stratum. A few flaked-lithic artifacts were recovered from the top of this stratum. Decomposing sandstone gravels account for about 1% of the matrix, and they are well sorted. The lower boundary is diffuse and irregular.

Stratum IIIb has many of the same characteristics as Stratum IIIa. The primary difference is that the amount of calcium carbonate increases. The sediments react violently to hydrochloric acid. The lower boundary remains concealed.

Stratum III represents a Bk soil horizon that grades into a cambic soil horizon as the amount of calcium carbonate increases.

Material Culture

One hundred and ninety-nine artifacts were analyzed from the site. The surface assemblage includes 160 flakes, 7 cores, 2 hammerstone, 2 utilized flakes, a graver, and a projectile point fragment. The cores and the flakes were analyzed in the field, and the tools were collected. A total of 26 artifacts was recovered from subsurface testing. These consist of 21 flakes, 4 cores, and a utilized flake. Three flakes and the utilized flake were found while shovel testing. The remaining artifacts were uncovered in Test Unit 2. Quantitative data on the tools and cores are presented in Appendix III.

Flaked-lithic artifacts

One brown chert projectile point fragment was collected at the site but is too incomplete to make any accurate comparisons with other projectile points. All that remains is one weakly barbed shoulder and the blade midsection.

The other tools include three utilized flakes, two hammerstones, and a graver. The graver is manufactured from brown chert with numerous inclusions. This artifact

is an unbroken flake with a small flaked projection or point along one margin. The projection exhibits bimarginal flaking and evidence of slight use wear. The three utilized flakes have unimarginal use wear. The two found on the surface are complete flakes, while the subsurface utilized flake is broken.

The two hammerstones were found on the surface. One of these is a relatively small orthoquartzite gravel. This specimen has battering on opposite ends of the long axis of the gravel. Battering activities caused some spalling, but over 50% of the weathered cortex remains. The other hammerstone is a complete, waterworn quartz gravel with inclusions. Battering is present on both ends. One end of the gravel is pointed and other end is much broader. The broad end possesses more surface area and exhibits more extensive battering.

Eleven cores were analyzed, the majority of which are core fragments. Seven were found on the surface, and the other four were recovered from Test Unit 2. Seven are manufactured from orthoquartzite, two from chert, and two from chalcedony. All of the cores possess at least some cortex. The chert and chalcedony cores are smaller than the orthoquartzite specimens and represent nearly exhausted artifacts. All four subsurface cores are orthoquartzite and are bidirectionally reduced. Three are core fragments.

One hundred and eighty-one non-tool flaked-lithic artifacts were analyzed. Twenty-one flakes were recovered from subsurface excavations, and the data from these are combined with those from the surface flakes (Table 14.2). Locally procured raw materials were used at the site, with orthoquartzite comprising close to three quarters of the assemblage. Simple flakes are by far the most frequent flake type, but a high number of complex flakes are also present. The majority of the flakes do not have cortex. All flake sizes are present, with more medium-sized flakes represented than any other flake size. Overall, the flakes tend to be small, with seventy-nine percent smaller than 1".

These flake characteristics are suggestive of middle- to late-stage reduction activities. The high number of flakes with no cortex supports this conclusion. The high number of small and complex flakes suggests that although earlier stages of core reduction probably did occur, reduction activities were concentrated on the later stages. It is suggested that the high percentage of orthoquartzite (84%) and chalcedony (93%) flakes without cortex can be explained through cores being brought to the site that were initially prepared elsewhere. Under the Sullivan and Rozen (1985) classification, tool production is interpreted as the primary activity at the site. This determination is

Table 14.2. Surface and subsurface non-tool flaked-lithic debitage, 5PE1805, FCMR.

Material	Quartzite/Orthoquartzite				Chert				Chalcedony				Total	
Type	S	SS	Subtotal	%	S	SS	Subtotal	%	S	SS	Subtotal	%	No.	%
Size Grade														
>1"	32	3	35		1	0	1		2	0	2		38	21
1/2" - 1"	51	14	65		8	0	8		6	1	7		80	44.2
<1/2"	32	3	35		8	0	8		20	0	20		63	34.8
Total	115	20	135	74.6	17	0	17	9.4	28	1	29	16	181	100
Flake Type (Ahler 1997)														
Shatter	0	0	0		0	0	0		0	0	0		0	0
Simple	85	12	97		12	0	12		22	1	23		132	72.9
Complex	30	8	38		5	0	5		6	0	6		49	27.1
Bifacial Thinning	0	0	0		0	0	0		0	0	0		0	0
Total	115	20	135	74.6	17	0	17	9.4	28	1	29	16	181	100
Cortex														
Present	18	11	29		9	0	9		2	1	3		41	22.7
Absent	97	9	106		8	0	8		26	0	26		140	77.3
Total	115	20	135	74.6	17	0	17	9.4	28	1	29	16	181	100
Flake Type (Sullivan and Rozen 1985)														
Complete	2	6	8		0	0	0		0	0	0		8	4.4
Broken	30	10	40		2	0	2		2	1	3		45	24.9
Flake Fragment	83	4	87		15	0	15		26	0	26		128	70.7
Debris	0	0	0		0	0	0		0	0	0		0	0
Total	115	20	135	74.6	17	0	17	9.4	28	1	29	16	181	100

S Surface
SS Subsurface

supported by the high percentage of broken flakes combined with the high number of flake fragments. Complete flakes and debris, which are linked to core reduction, are nearly nonexistent. The presence of cores at the site indicate that to some degree core reduction was also occurring.

Comparisons were made between the subsurface and the surface flake assemblage. Since the subsurface remains represent only 11.6% of the overall total, the comparisons are not particularly meaningful. A few generalizations, however, can be made about the two assemblages. Subsurface flakes are overwhelmingly made from orthoquartzite; all but one of the twenty-one flakes from the subsurface are orthoquartzite. The four cores recovered from Test Unit 2 are also made from orthoquartzite. This contrasts slightly with the surface assemblage where chert and chalcedony are present although orthoquartzite is still the major material type. The absence of small debitage in the test unit control samples suggests that smaller flake types, such as thinning or resharpening flakes, are not occurring at the site. The percentage of complex flakes was slightly higher in the subsurface, but overall the flake type percentages are similar.

Faunal

Two *Rodentia* bones were recovered from Test Unit 2 (Appendix V).

Summary and Conclusions

The excavation of Test Unit 1 and a number of the shovel tests indicated that the site did not extend beyond the limits of the surface scatter. The overwhelming majority (88%) of the surface flakes and all the surface tools except for one hammerstone occur in a 135m² concentration near the center of the site. It is not surprising then that the four shovel tests that produced artifacts were within this concentration. Test Unit 1 and the other twenty-one shovel tests produced no artifacts. A utilized chert flake was found between 0 and 10 cm below the surface in Shovel Test 20. Two of the three flakes found during shovel testing were recovered from the first 5 cm of excavation. The other flake was recovered in the first 20 cm. In Test Unit 2 all four cores and fourteen of the eighteen flakes were located within the first 16.5 cm below the ground surface. Three more flakes were found in the next 10-cm level. After one sterile 10-cm level, a final flake was recovered from the last 10-cm level. The presence of one flake in the last level was believed to be the result of bioturbation. Cultural material extends from the surface to a depth between 9.5 and 26.5 cm below the ground surface within Strata I, II, and the very top of III (IIIa).

Despite the large number of artifacts at the site, the overall assemblage lacks

diversity. Ninety percent of the artifacts are flakes. The presence of cores and hammerstones indicates that some stages of core reduction occurred at this location. Formal tools are rare, and expedient tool varieties (i.e., utilized and retouched flakes) are more common. The small number of tools suggests that tool production activities, if present, were limited. Locally procured raw materials were exploited, with a heavy reliance on orthoquartzite. The small artifact concentration near the site's center was the location of intense but temporary activities that concentrated on lithic reduction. No diagnostic artifacts were found at the site. One charcoal sample was not processed due to the small sample size and because it was believed to be natural in origin. The temporal affiliation of the site is uncertain. Artifacts are confined to the surface or in near-surface context with little to no potential for significant buried cultural deposits. The site has little research potential. The site is not recommended as eligible for nomination to the NRHP because so little can be understood about it that it is not possible to determine if specific important research questions can be answered by data contained in the property.

CHAPTER 15
5PE1807

Introduction

This prehistoric sheltered site was originally recorded by FLC during the inventory of portions of Booth Mountain (Charles et al. 1997:6.60-63). Eleven flakes, one orthoquartzite chopper, and one chalcedony core fragment were mapped along the bench in front of a small alcove. A small concentration (1-x-1-m) of sandstone was present on the bench in front of the alcove. This sandstone cluster was interpreted to be a possible hearth; however, a trowel probe within the concentration failed to recover charcoal or cultural debris. Pieces of two partially buried juniper branches were propped up against the inside of the alcove. The site was interpreted to be a temporary shelter and the locus of intensive core reduction. Temporally diagnostic artifacts were not observed; therefore, the temporal affiliation was determined inconclusive. Based on the association with the juniper branches in the shelter, it is possible that the site was occupied during the protohistoric or early historic period. The potential for buried deposits at the site was deemed good due to the accumulation of residual, colluvial, and eolian sediments both in the alcove and along the bench.

The site was recommended as eligible for nomination to the NRHP. This evaluation was based on the potential for this site to yield information important to the research domains outlined by Eighmy (1984) for the Colorado Plains, and the research themes of settlement patterns, economies, and geomorphology of the FCMR (Zier et al. 1987).

This small (408 m^2) site is located on the Stone City U.S.G.S. 7.5' quadrangle (Figure 15.1). Elevation at the alcove is 6,350 ft (1,935 m) asl. The site is on a level bench along the north side of a north- and east-sloping ridge in the interior of Booth Mountain. A 6-x-8-m-high sandstone escarpment forms the southern edge of the site. The surrounding slope is about 10°. Large sandstone boulders are found along the north edge of the bench. The alcove measures 5 m x 3 m. It is 1.25 m high at the front and slopes to .75 m at the back. The alcove faces north with an aspect between 0° and 25°. The site is situated within a pinyon and juniper woodland. Other vegetation on the site consists of mountain mahogany, cacti, gooseberry, scrub oak, and grasses (Figure 15.2). The closest water source is a large, unnamed ephemeral drainage 150 m downslope (north) of the site. Two small, natural, water-catchment basins were observed on the escarpment above the site. The site is in stable condition with a moderate amount of erosion.

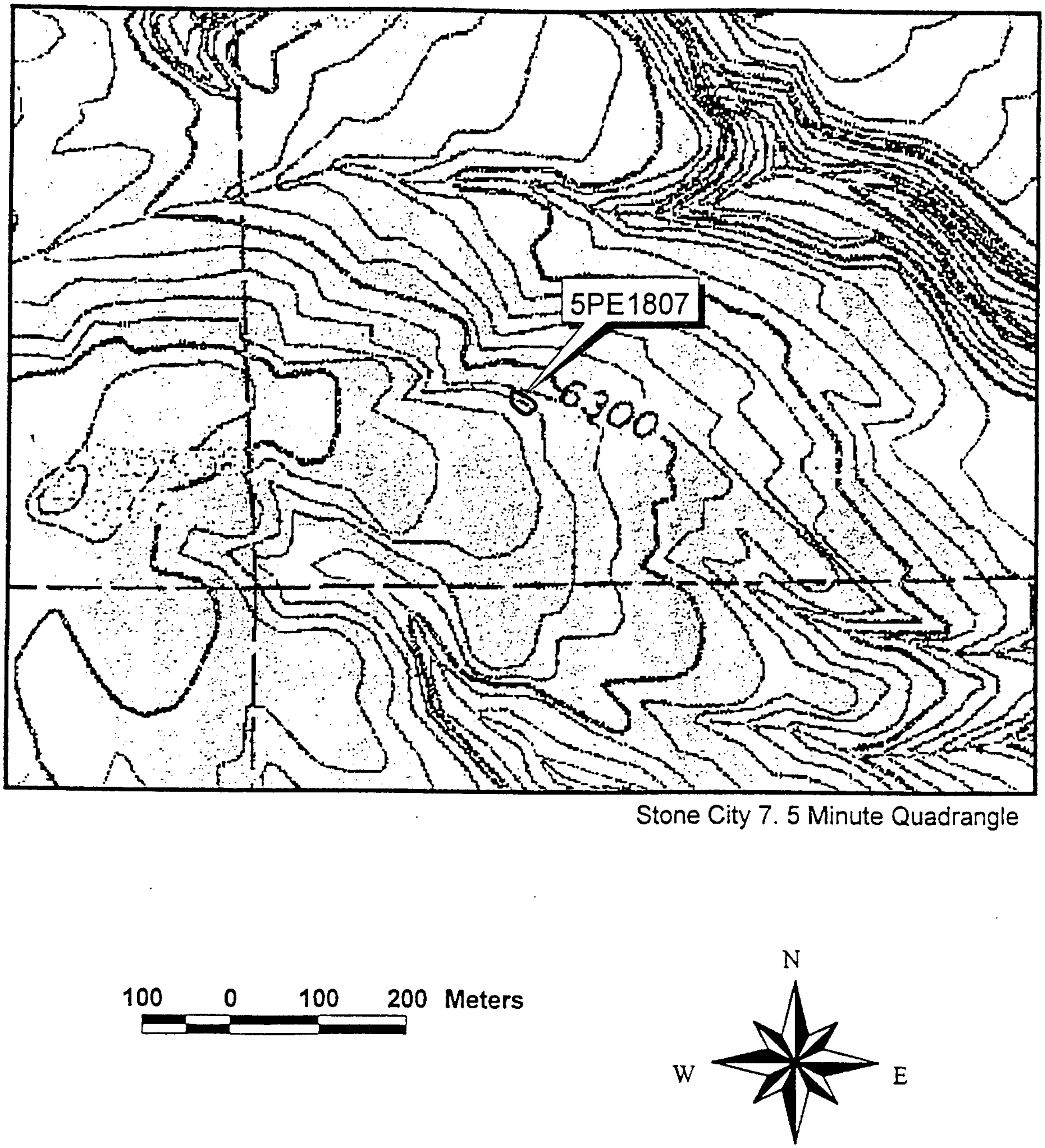


Figure 15.1. Location map, 5PE1807, FCMR.

Figure 15.2. Overview of site, 5PE1807, FCMR. View is to the southeast.

Surface Investigations

The alcove and the bench were inventoried for artifacts. All surface artifacts were pinflagged. Upon determination of the site boundary, survey points were taken with a Total Station to produce a site map (Figure 15.3). Ten flakes and two core fragments were analyzed in the field, and a single chopper was collected for further analysis.

Subsurface Investigations

Nine shovel tests and two test units were excavated at the site.

Shovel Tests

The nine shovel tests were placed along the bench directly in front (north) of the alcove. The shovel tests were excavated to culturally sterile sediments, to bedrock, or until the test hole could no longer be excavated with the available equipment (~70 cm). Seven of the nine shovel tests (78%) produced artifacts. A noticeable dark-brown stratum appeared in some of the shovel tests. Detailed description of the shovel test stratigraphy is presented in Appendix II.

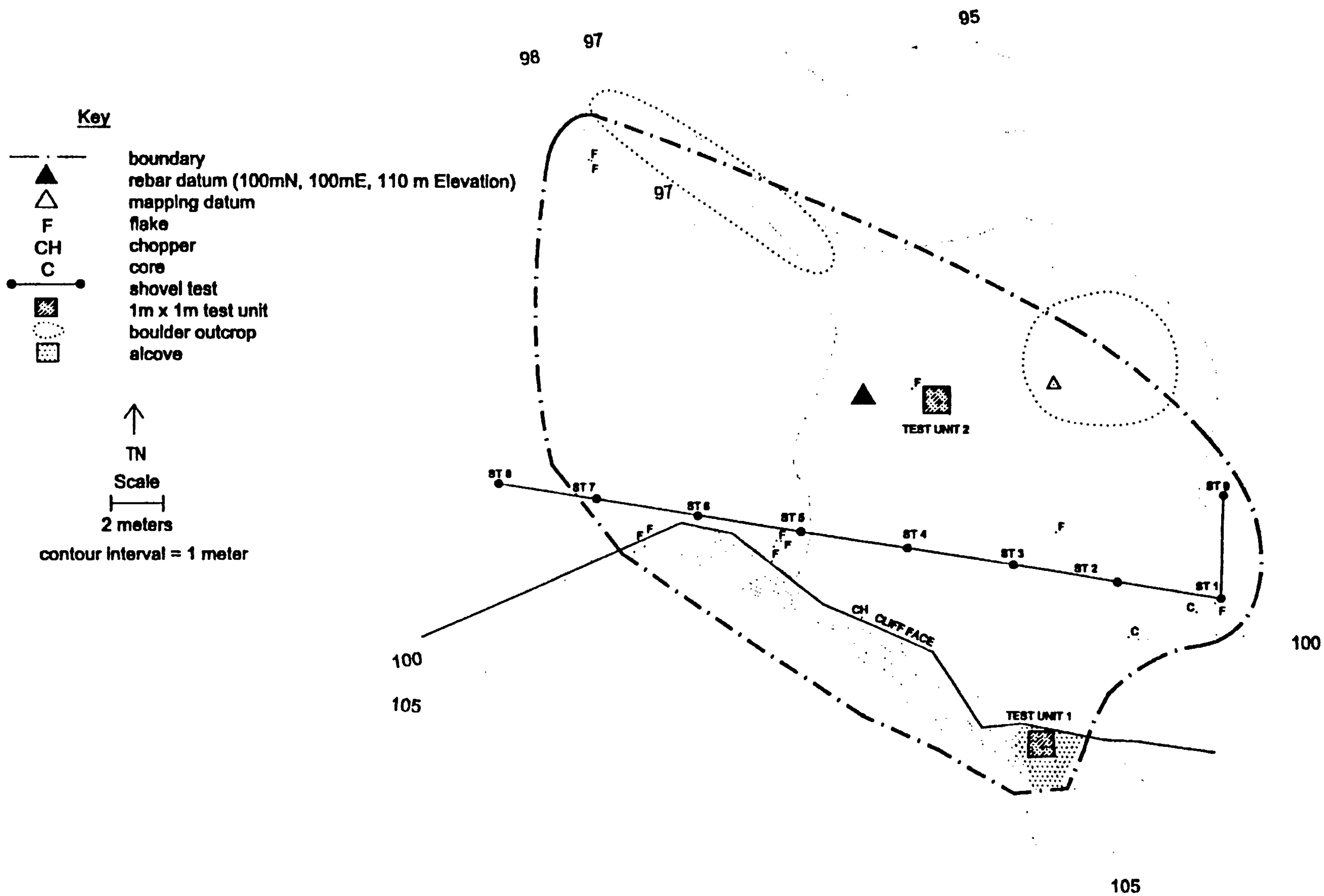


Figure 15.3. Site map, 5PE1807, FCMR.

Test Units

Two test units were excavated at the site. Test Unit 1 was placed underneath the overhang of the alcove, while Test Unit 2 was placed on the bench 12 m north of the alcove. Both test units produced subsurface artifacts and a buried ethnostratigraphic layer. The test unit results are summarized below in Table 15.1

Test Unit 1

Test Unit 1 was placed under the overhang in the narrow opening of the small alcove. This test unit was excavated in three stratigraphic layers. The final depth was between 50.5 and 61 cm below the ground surface. The datum was placed in the southeast corner (85.52 mN, 100.04 mE, 0.406 masd), and the control unit was originally in the northeast corner. Beginning in Level 2/Layer 3, the control unit was moved to the northwest corner. Layer 1 consisted of a thin (0.5 to 2.5 cm) layer of loose sediments and organic materials. There was no sod layer in this test unit. After the removal of the loose sediments, a layer change to Layer 2 was initiated. Four levels were excavated in Layer 2. Sediments in this layer consisted of a grayish brown sand. A deer phalanx and a flake were recovered from Level 2/Layer 2, and a chalcedony flake and two small pieces of oxidized sandstone were recovered from Level 3/Layer 2. Midway through Level 4, Layer 2, a layer change was made due to the presence of a mottled dark-brown sand layer with charcoal. This change was made between 29.5 and 38.5 cm below ground surface. Layer 3 was excavated in two levels to a depth of 61 cm below the ground surface when a large piece of angular disintegrating sandstone appeared in the unit. At this point excavations were terminated because eligibility had been established through the identification of a buried ethnostratigraphic unit. Layer 3 contained flaked-lithic artifacts, macrobotanical remains, charcoal, and faunal remains. A charcoal sample on charred material was submitted for radiocarbon dating from Level 2/Layer 3. This sample produced a calibrated 2–sigma radiocarbon age of 1540 - 1275 BP (Beta 140323), with an intercept date of AD 585 (Appendix VII).

Four strata were identified in the west (east-facing) and in the north (south-facing) wall profiles (Figure 15.4). These strata are described below.

Stratum I — Stratum I is a very thin (3 to 6 cm) layer of pinkish gray (7.5YR 6/2) sand. The soil structure is single-grain. The lower boundary is clear and smooth. There is no reaction of the sediments to hydrochloric acid. The estimated percentage of sandstone gravel is < 3%. No artifacts were recovered from these loose surface sediments.

Table 15.1. Test unit summaries, 5PE1807, FCMR.

Test Unit No.	Layer	Level	Thickness Range (bgs)	Materials Recovered 1/4"	1/16" Control
1	1	*	0.5-2.5 cm	None	No control sample
1	2	1	1.5-11.5 cm	None	+1 unknown bone
1	2	2	7.5-10.5 cm	1 bone	+1 flake-lithic artifact, ^{14}C sample, 36 bones
1	2	3	9-11 cm	1 flaked-lithic artifact	+^{14}C sample, 84 rodent bones
1	2	4	7-8 cm	None	+40 rodent bones, snail shells, seeds, ^{14}C sample
1	3	1	10-14 cm	8 flaked-lithic artifacts, 6 mammal bones, ^{14}C sample, seeds	+2 flaked-lithic artifacts, ^{14}C sample, 201 rodent bones
1	3	2	7-12.5 cm	4 flaked-lithic artifacts, 1 core, ^{14}C sample[1], seeds	3 flaked-lithic artifacts, 91 squirrel bones
2	1	*	1-2 cm	None	No control sample
2	2	1	1-12 cm	2 flaked-lithic artifacts	Seeds
2	2	2	10 cm	4 flaked-lithic artifacts	1 flaked-lithic artifact, seeds
2	2	3	10 cm	1 flaked-lithic artifact, ^{14}C sample[1]	None
2	3	1	0-10 cm	1 chopper,1 flaked-lithic artifact, ^{14}C sample	None
2	3	2	0-10 cm	None	None
2	3	3	0-0 cm	None	None
2	3	4	7-20 cm	None	None

* Excavated as single stratigraphic layer
+ Sample was floated

[1]Radiocarbon date obtained.

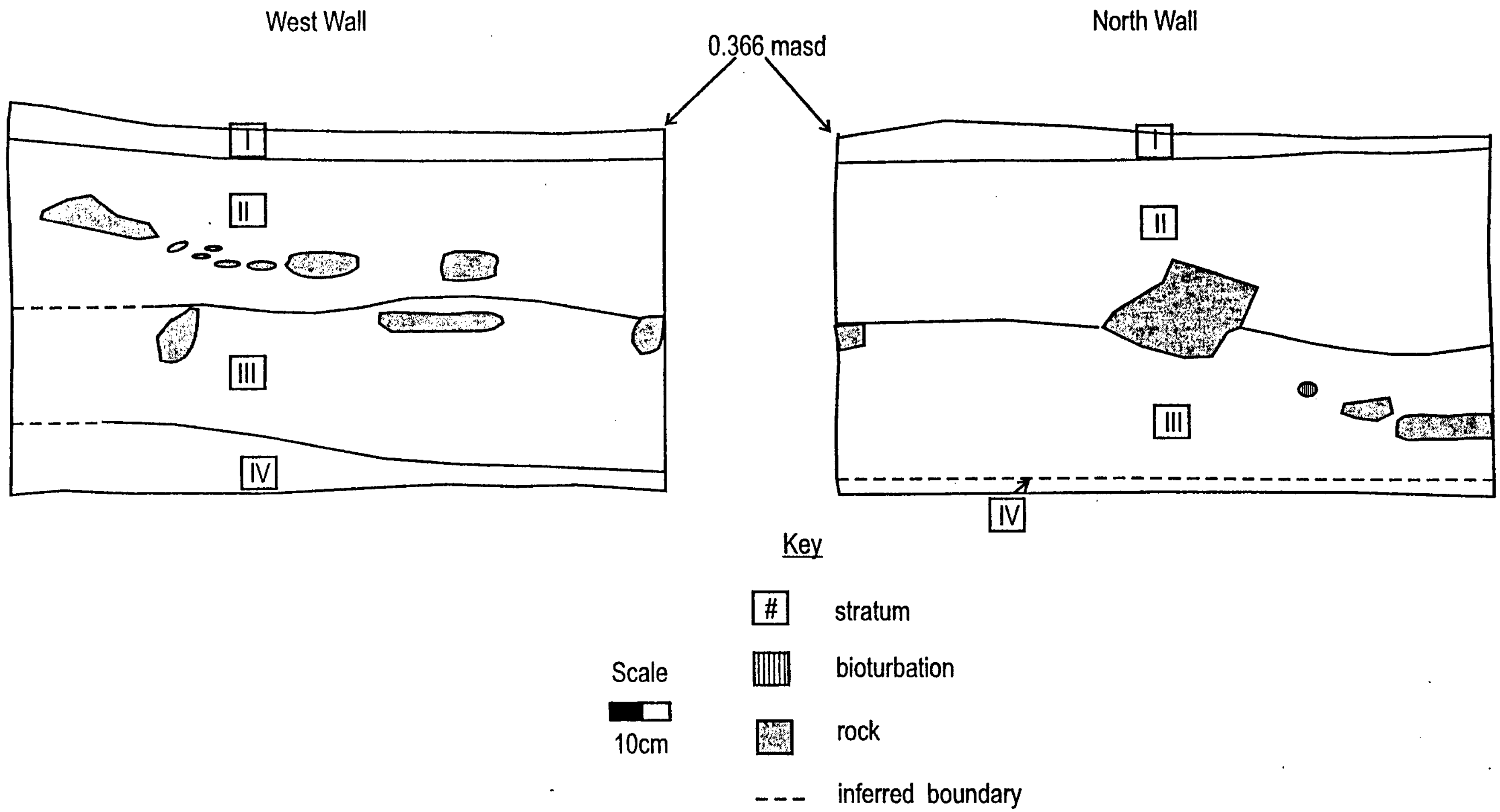


Figure 15. 4. West-wall profile and north-wall profile, Test Unit 1, 5PE1807, FCMR.

Stratum II Stratum II is a thick (24 to 32 cm) layer of brown (7.5YR 5/4) sand. The soil structure is single-grain. The lower boundary is clear and wavy. There is no reaction to hydrochloric acid. Sandstone cobbles and boulders are present in the stratum, and sandstone gravels account for between 7% and 10% of the total matrix. Roots are present as a form of bioturbation. An occasional artifact and bone occur in the stratum along with sparse charcoal.

Stratum III Stratum III is a very dark, grayish brown (10YR 3/2) sandy loam. The soil structure is single grain. The stratum is between 17 and 24 cm thick. The lower boundary is diffuse and undulating. Charcoal, flaked-lithic artifacts, and faunal and floral specimens occur in this ethnostratigraphic unit. Sandstone gravel accounts for about 5% of the matrix. The sediments do not react to hydrochloric acid. This is a possible buried A soil horizon.

Stratum IV Stratum IV is a brown (7.5YR 5/4) sand. The soil structure is single-grain. There is a moderate reaction to hydrochloric acid, except on the sandstone which reacts violently to hydrochloric acid. Sandstone cobbles, boulders, and roots occur in the stratum along with sandstone gravels, which make up between 1% and 5% of the matrix. These sediments may represent a buried Bk soil horizon. A few flaked-lithic artifacts were recovered from the stratum. The lower boundary remains concealed.

Test Unit 2

Test Unit 2 was placed on the bench slightly downslope of the alcove. This unit was placed to bisect a possible hearth feature (Figure 15.5). The test unit was excavated in three stratigraphic layers. The final depth at bedrock was between 35 and 77 cm below the ground surface. The datum was located in the southeast corner (98.85 mN, 96.06 mE, 0.507 mbsd), and the control samples were collected from this corner as well. Layer 1 was removed as a thin (1 to 2 cm) sod and loose sand layer; this layer contained no cultural material. A layer change to Layer 2 was initiated directly below the sod layer at the point where the deposits became darker, more charcoal enriched, and contained artifacts. Layer 2 was excavated in three levels until the darker sediments became mottled with lighter sediments. Layer 2 was terminated at a depth between 22 and 33 cm below the ground surface. A chopper located at 33 cm below the ground surface was positioned at the contact between the dark, charcoal-enriched deposits of Layer 2 and the lighter sediments of Layer 3. It is believed that this chopper was lying on a prehistoric use surface. A sample of charred material from Level 3/Layer 2, was submitted for radiocarbon dating. This sample produced a 2–

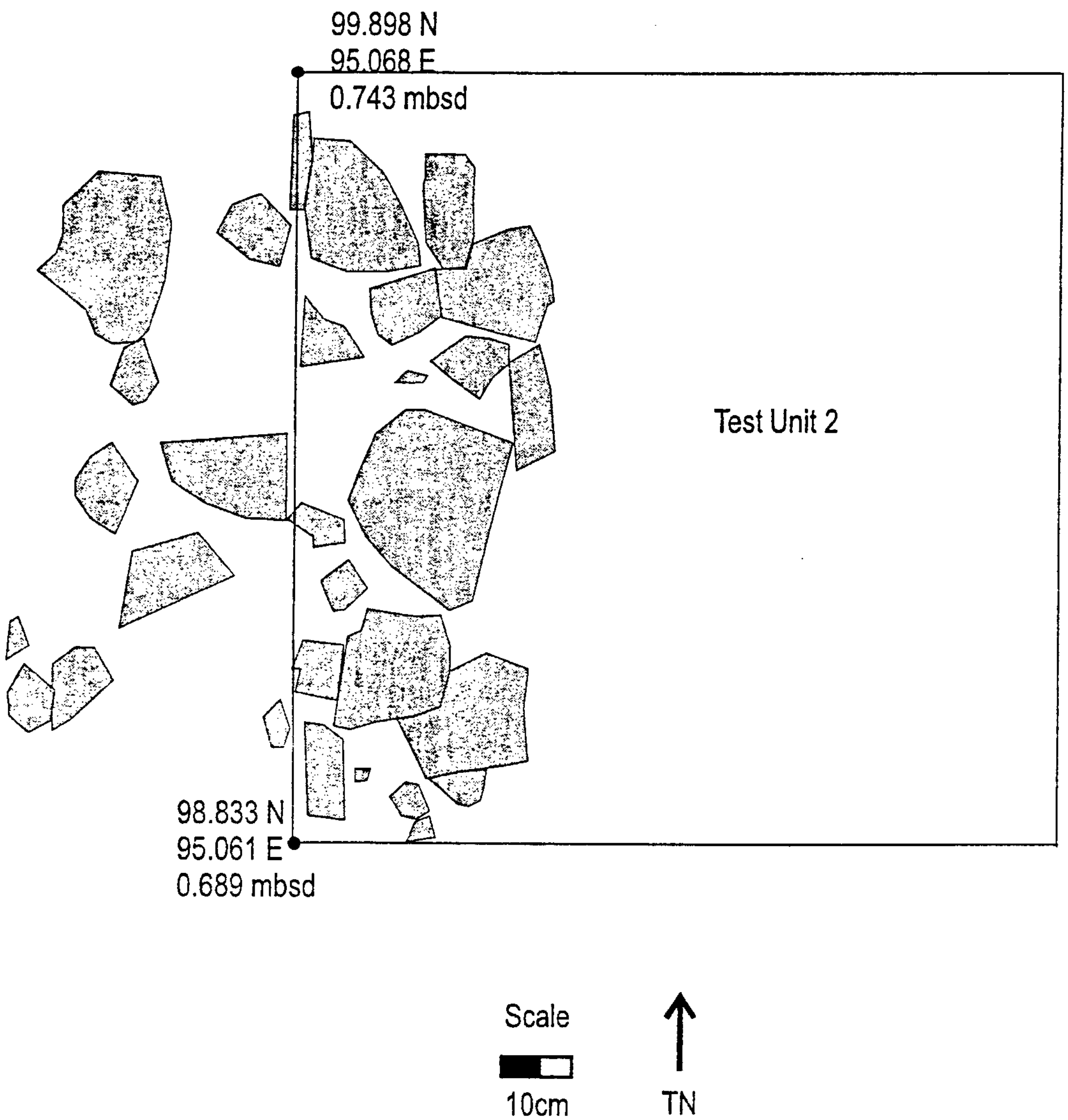


Figure 15.5. Planview, possible hearth feature, Test Unit 2, 5PE1807, FCMR.

sigma calibrated radiocarbon age of 1565-1325 BP (Beta 140324), with intercept dates of AD 465, AD 480, and AD 420. Layer 3 was excavated in four levels to sandstone bedrock. Although a few artifacts and charcoal were recovered from Level 1/Layer 3, these artifacts are believed to have been lying along the base of Layer 2, which is a thick cultural layer. At the base of Level 1/Layer 3, bedrock surfaced in the northeast corner. Excavations were continued until bedrock was exposed across the entire unit.

The possible hearth feature observed on the surface did not produce subsurface evidence to substantiate its designation as a hearth. Instead, the concentration of sandstone at best represents a collapsed cairn.

Three strata were identified in the south (north-facing) and the west (east-facing) wall profiles (Figure 15.6). These strata are described below.

Stratum I	Stratum I is a thin (1 to 7 cm) layer of gray (10YR 5/1), fine to medium sand. There is no soil structure in this stratum. The lower boundary is clear and wavy. There is no reaction to hydrochloric acid. Roots, insect larvae, sandstone, coarse sand, and pebbles are present. Poorly sorted sandstone gravels account for between 1% and 5% of the matrix. No artifacts were recovered from this stratum.
Stratum II	Stratum II is a very dark gray (10YR 3/1) sandy loam. The soil structure is subangular blocky and moderately developed. The lower boundary is gradual and smooth. The lower boundary becomes mottled as it changes to Stratum III. Roots, insect larvae, and insect krotovina are present in the stratum along with poorly sorted sandstone gravels, which account for between 1% to 5% of the matrix. Flaked-lithic artifacts and charcoal are common in this ethnostratigraphic layer. This stratum may represent a buried A soil horizon.
Stratum III	Stratum III is a brown (10YR 5/3) sandy loam. The stratum is between 22 and 53 cm thick. The lower boundary is very abrupt and irregular with the underlying sandstone bedrock. Roots, insect larvae, and insect krotovina occur in the stratum along with sandstone gravels. The gravels are poorly sorted and comprise between 1% and 5% of the matrix. The soil structure is subangular blocky and weakly developed. Artifacts were found at the contact with Stratum II. These artifacts include a chopper thought to be positioned on a prehistoric use surface. This stratum represents a possible buried B (bB) soil horizon.
Stratum IV	Sandstone bedrock (R horizon). This stratum is not shown on the profile drawing.

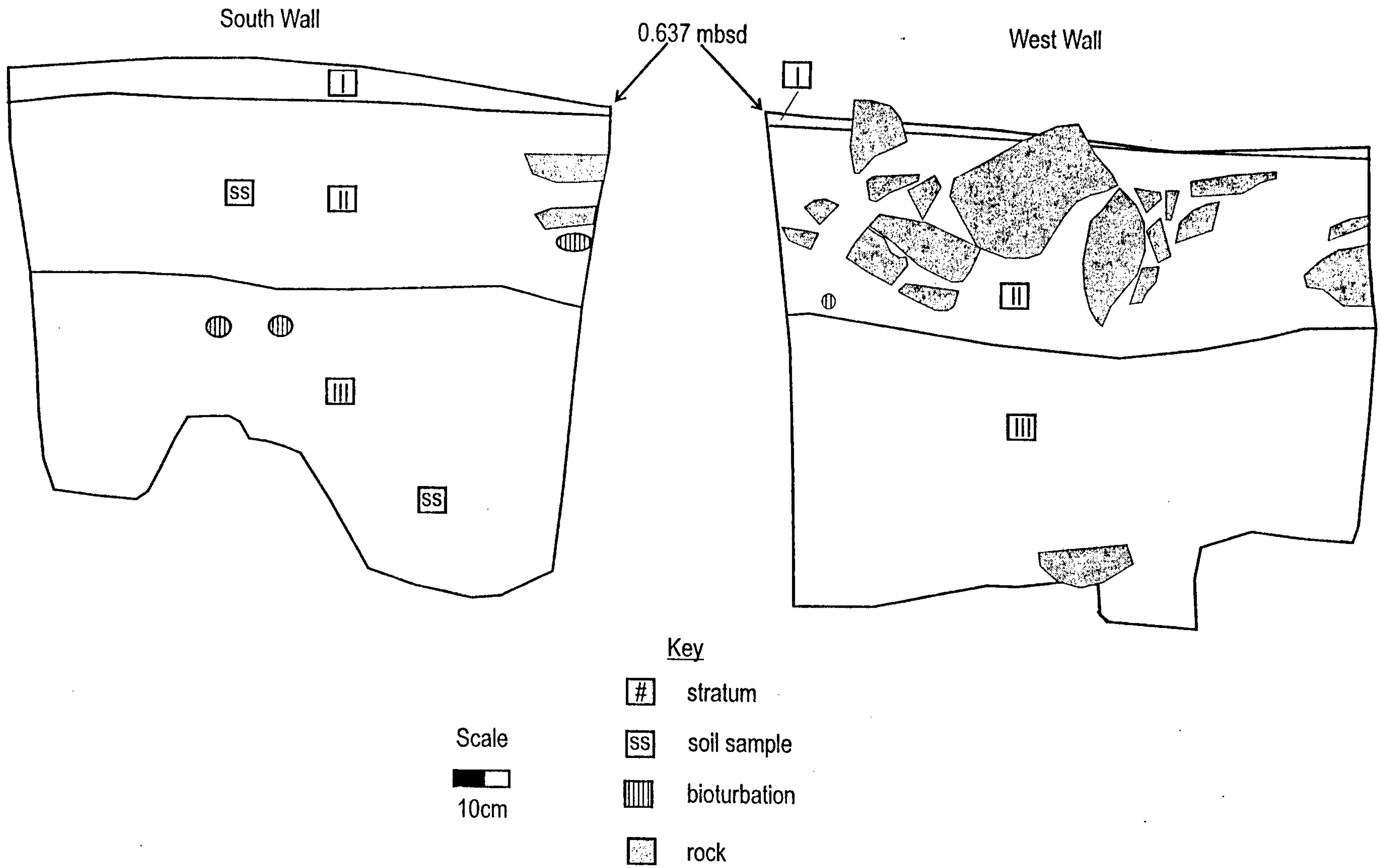


Figure 15.6. South-wall profile and west-wall profile, Test Unit 2, 5PE1807, FCMR.

Material Culture

A total of 60 artifacts was analyzed. The 13 surface artifacts comprise 10 flakes, 2 core fragments, and a chopper. The surface flakes and the core fragments were analyzed in the field and left. The chopper was collected for further examination. Subsurface artifacts are more plentiful. Forty-three flakes, two cores, one chopper, and one retouched flake were recovered from the excavation of two test units and from seven of nine shovel tests. Quantitative information on the flaked-lithic tools and cores is found in Appendix III.

Flaked-Lithic artifacts

The two choppers are very similar in overall appearance. Both choppers utilized naturally wedge-shaped tabular pieces of orthoquartzite that have an oblique triangular shape in cross-section. The chopper found on the surface has two unifacial retouch flakes removed along the pointed edge. There is some evidence of battering along this edge. The chopper recovered from Test Unit 2 has five unifacial flakes removed along the pointed edge. There is no visible evidence of use; however, the modified edge is sharp. A retouched chalcedony flake was recovered from Shovel Test 5. This artifact is a small (<½") fragment of a larger tool. The modified edge extends to the break. Bimarginal retouching and unifacial use wear are noted along the tool edge.

Four cores were analyzed from the site. The two from the surface are chalcedony core fragments. One has one flake removed and the other has three flakes removed. These fragments are nearly equal in size. The core fragment from Test Unit 1 is a tabular piece of orthoquartzite with one flake removed. The core found in Shovel Test 2 is a nearly expended limestone core encrusted with reddish brown chert showing two visible flake scars. Roughly twenty percent of the limestone has chert covering it.

Interpretations made on the non-tool flaked-lithic assemblage are limited by the presence of only 53 artifacts. The surface data were integrated with the information gathered from the subsurface artifacts (Table 15.2). Subsurface flakes account for 80% of all flakes. Locally procured raw materials dominate the assemblage, with orthoquartzite accounting for just over one-half of the total. Fifty-seven percent of the flakes are smaller than ½". The two smallest flake sizes are responsible for almost ninety percent of the total assemblage. Simple flakes are easily the most frequent flake type, and the vast majority of flakes have no visible cortex.

These flake characteristics are suggestive of middle- to late-stage reduction activities. The high number of small- to medium-sized simple flakes with no cortex

Table 15.2. Surface and subsurface non-tool flaked-lithic debitage, 5PE1807, FCMR.

Material	Quartzite/Orthoquartzite				Chert				Chalcedony				Quartz				Total	
Type	S	SS	Subtotal	%	S	SS	Subtotal	%	S	SS	Subtotal	%	S	SS	Subtotal	%	No.	%
Size Grade																		
>1"	5	2	**7**		0	0	**0**		0	0	**0**		0	0	**0**		**7**	*13.2*
1/2" - 1"	2	9	**11**		0	1	**1**		1	2	**3**		1	0	**1**		**16**	*30.2*
<1/2"	0	9	**9**		0	12	**12**		0	7	**7**		1	1	**2**		**30**	*56.6*
Total	**7**	**20**	**27**	*50.9*	**0**	**13**	**13**	*24.5*	**1**	**9**	**10**	*18.9*	**2**	**1**	**3**	*5.7*	**53**	*100*
Flake Type (Ahler 1997)																		
Shatter	0	1	**1**		0	3	**3**		0	0	**0**		2	1	**3**		**7**	*13.2*
Simple	4	19	**23**		0	7	**7**		1	6	**7**		0	0	**0**		**37**	*69.8*
Complex	3	0	**3**		0	3	**3**		0	3	**3**		0	0	**0**		**9**	*17*
Bifacial Thinning	0	0	**0**		0	0	**0**		0	0	**0**		0	0	**0**		**0**	*0*
Total	**7**	**20**	**27**	*50.9*	**0**	**13**	**13**	*24.5*	**1**	**9**	**10**	*18.9*	**2**	**1**	**3**	*5.7*	**53**	*100*
Cortex																		
Present	1	4	**5**		0	1	**1**		0	1	**1**		1	0	**1**		**8**	*15.1*
Absent	6	16	**22**		0	12	**12**		1	8	**9**		1	1	**2**		**45**	*84.9*
Total	**7**	**20**	**27**	*50.9*	**0**	**13**	**13**	*24.5*	**1**	**9**	**10**	*18.9*	**2**	**1**	**3**	*5.7*	**53**	*100*
Flake Type (Sullivan and Rozen 1985)																		
Complete	5	5	**10**		0	2	**2**		0	4	**4**		0	0	**0**		**16**	*30.2*
Broken	1	7	**8**		0	2	**2**		0	1	**1**		0	0	**0**		**11**	*20.8*
Flake Fragment	1	7	**8**		0	6	**6**		1	4	**5**		0	0	**0**		**19**	*35.8*
Debris	0	1	**1**		0	3	**3**		0	0	**0**		2	1	**3**		**7**	*13.2*
Total	**7**	**20**	**27**	*50.9*	**0**	**13**	**13**	*24.5*	**1**	**9**	**10**	*18.9*	**2**	**1**	**3**	*5.7*	**53**	*100*

S Surface
SS Subsurface

supports this interpretation. Larger flakes with cortex are more suggestive of earlier stages of reduction. Using the Sullivan and Rozen (1985) categories, both core reduction and tool manufacturing occurred at the site. The combined percentages of flake fragments and broken flakes imply that tool production was the more common activity of the two. The presence of complete flakes supports the interpretation of core reduction, as does the paucity of formal tools and the presence of cores at the site.

Seven of the nine shovel tests produced fifteen subsurface flakes, one core, and one retouched flake. These artifacts were recovered from the surface to a depth of 40 cm below the ground surface. Nineteen flakes and one core fragment were found in Test Unit 1. Four of the six flakes collected from the control samples in Test Unit 1 could have fallen through the conventional ¼" mesh. A chopper and nine flakes were found in Test Unit 2. One flake was collected from control samples in this unit, and it was larger than ¼". The presence of small debitage in the control samples in Test Unit 1 suggests that smaller flake types such as thinning or resharpening flakes occur at the site.

Faunal

A total of 461 pieces of bone was recovered from Test Unit 1 and a shovel test. One *Odocoileus* bone was recovered, together with a small number (6) of small-, medium-, and large-sized mammal bones. The great majority (418) of the bones belong to naturally deposited *Rodentia* and *Sciuridae*. None of the bones is modified.

Macrobotanical

Eight samples were sent for macrobotanical analysis. These samples included the entire light fraction from eight control samples. Six samples were submitted from Test Unit 1, and two samples were submitted from Test Unit 2. Results from the macrobotanical analysis are presented in Appendix VI.

Summary and Conclusions

A strong case is made for the presence of a buried ethnostratigraphic layer in both test units. Two flaked-lithic artifacts were found in the first 29.5 to 38.5 cm of Test Unit 1. A layer change was made at this point because of a change in the stratigraphy. The next 21 to 22.5 cm produced 18 artifacts, which represent over one-third of all recovered subsurface artifacts. The first 32 to 43 cm in Test Unit 2 also produced cultural material. These artifacts were found in Stratum II at the contact with Stratum III. As is the case with Stratum III of Test Unit 1, Stratum II in Test Unit 2

represents an ethnostratigraphic layer. The last 27 to 40 cm was culturally sterile.

Despite the relatively small number of artifacts and the relatively small size of the site, testing has demonstrated that this site has the potential for significant archeological information. Seventy-eight percent of the artifact assemblage is from subsurface contexts. A buried, possible A, horizon was encountered in both test units and some of the shovel tests. No diagnostic artifacts have been documented at this site; however, charcoal dates from both test units overlap, indicating occupation during the Developmental period. The site is recommended as eligible for nomination to the NRHP under Criterion D; the potential to yield significant archaeological information. Furthermore, this site has the potential to yield information on the themes of chronology and cultural relationships, settlement patterns, the nature of prehistoric economies, horticulture, paleoclimates, technology and material culture, and geomorphology as defined in the CRMP (Zier et al. 1997). Its isolated position and difficulty of access are viewed as its best protective measures.

CHAPTER 16
5PE1809

Introduction

This relatively small (2,099 m²) prehistoric open site lacking features was originally recorded during the 1995 inventory of portions of Booth Mountain (Charles et al. 1997:6.66-68). The artifacts, which included core fragments, groundstone tool fragments, flakes, and a single broken biface, were primarily found in small braided gullies between stabilized areas of standing and downed trees. The non-tool debitage assemblage showed a high number of complete flakes. The number of complete flakes and the presence of cores and core fragments suggested that unintensive core reduction was taking place at this location. The presence of groundstone indicates that plant or animal processing were also conducted at the site. Because artifacts were eroding into the gullies, it was suggested that other artifacts and features could be buried. Diagnostic artifacts were not present in the surface artifact assemblage, but the variety of other artifacts suggested that diagnostic artifacts may lie buried. It was, therefore, recommended that the site was eligible for nomination to the NRHP. This recommendation was based on the potential for this site to yield information important to the research themes of the FCMR (settlement patterns, economics [Zier et al. 1987]), and to the research domains outlined by Eighmy (1984) for the Colorado Plains. Specifically, the site could contribute to an understanding of resource exploitation and procurement within the Plains/Mountain Transition.

The site is located on a bench on the north side of a large ridge in the interior of Booth Mountain (Stone City U.S.G.S. 7.5' quadrangle [Figure 16.1]). The bench slopes gradually to the east. The elevation of the site is 6,320 ft (1,926 m) asl. The site is within a fairly level, open area in a woodland setting (Figure 16.2). The slope on the site is about 2°. Aspect from the site is to the northeast. Vegetation includes pinyon, juniper, mountain mahogany, cacti, narrow-leaf yucca, scrub oak, skunkbush, buckwheat, and grasses. Sediments on the site are comprised of silty sands derived from residual weathering of the bedrock with some minor eolian silts. The sediments are transported to the site through slope wash. Disturbance from these slope wash processes has lightly impacted the context of the site in that artifacts have accumulated in the small gullies on the site. Sediment depth is greater in the western portion of the site. Bedrock is exposed over 60% to 80% of the surface of the eastern one-third of the site.

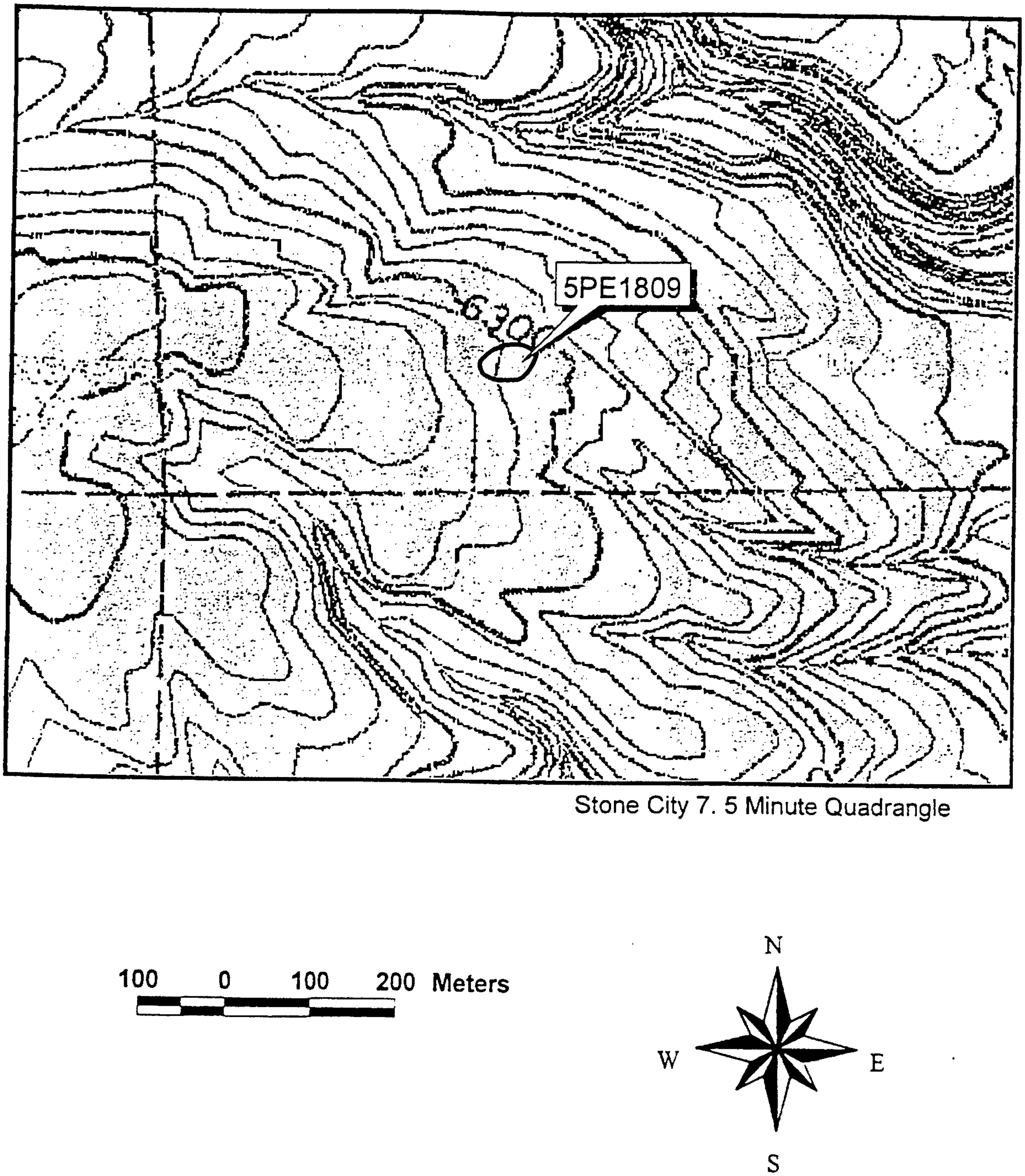


Figure 16.1. Location map, 5PE1809, FCMR.

Figure 16.2. Site overview, 5PE1809, FCMR. View is to the south.

Surface Investigations

The site was inventoried for surface artifacts. Forty-four flakes, five cores, and a mano fragment were analyzed in the field. Artifacts collected for further analysis included a biface and a projectile point. After defining the site boundary, survey points were taken with a Total Station, and a site map was generated (Figure 16.3).

Subsurface Investigations

Thirty shovel tests and two test units were excavated at the site.

Shovel Tests

Thirty shovel tests were excavated in four lines at this site. The shovel tests were placed a distance of 4 m apart. They were excavated to culturally sterile sediments, to bedrock, or until the test hole could no longer be excavated with the available equipment (~70 cm). The first shovel test line was oriented northwest to southeast. Ten shovel tests were excavated in this line. A second line was placed perpendicular to the first and intersected the first line at Shovel Test 4. This line contained 12 shovel tests. The third and fourth shovel test lines were placed near the southern portion of the site. They were placed perpendicular to the first line. Four shovel tests each were

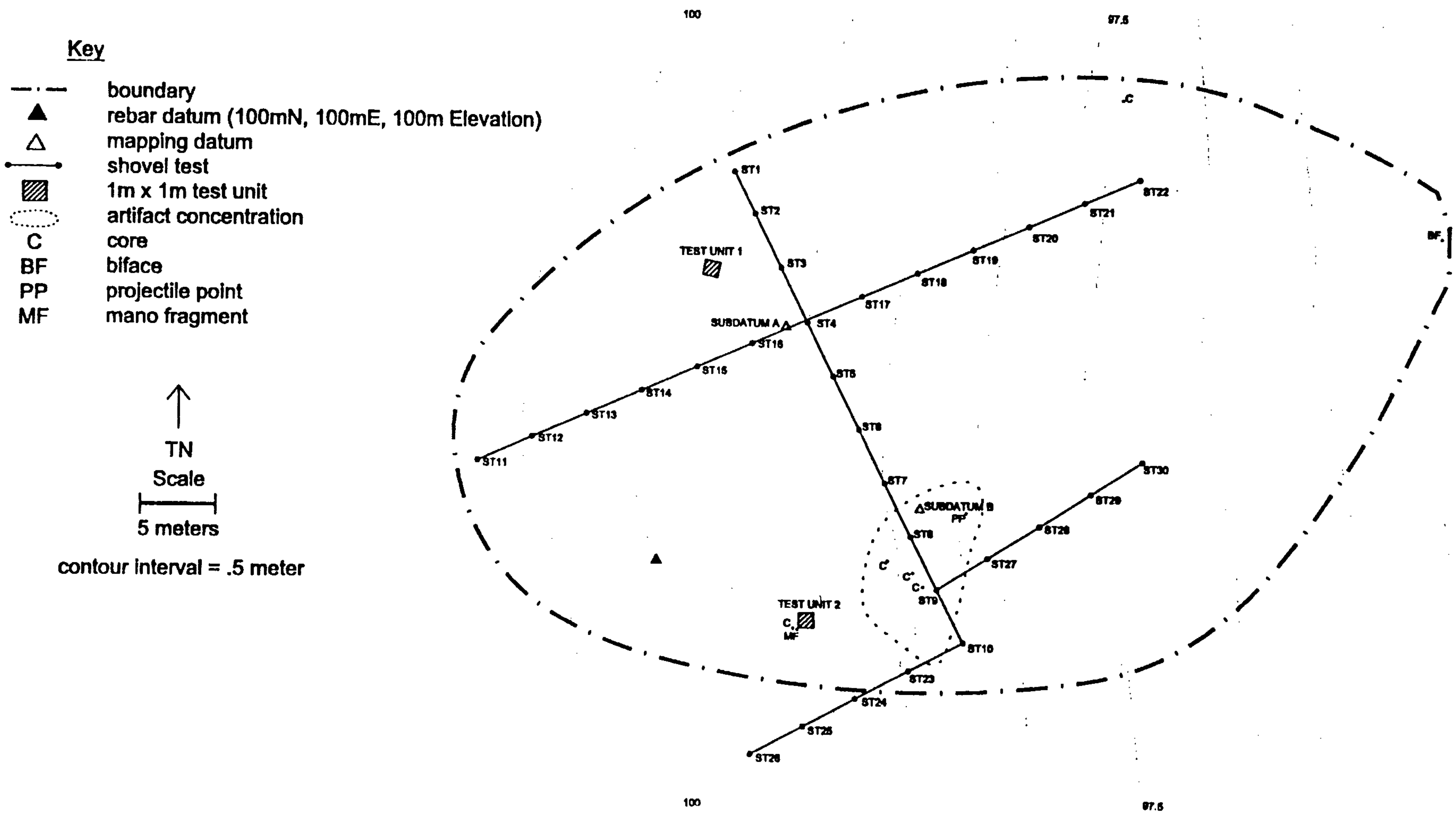


Figure 16.3. Site map, 5PE1809, FCMR.

excavated in the third and fourth lines, which intersected the first line at Shovel Test 10 and Shovel Test 9, respectively. No subsurface artifacts were recovered in any of the shovel tests.

Test Units

Two test units were excavated at this site, one near the northern edge and the other at the southern edge. A summary table of the results of test unit excavations is presented in Table 16.1.

Table 16.1. Test unit summaries, 5PE1809, FCMR.

Test Unit No.	Layer	Level	Thickness Range (bgs)	Materials Recovered 1/4"	1/16" Control
1	1	1	0-11 cm	None	No control sample
1	1	2	10 cm	None	None
1	1	3	8-13 cm	None	None
2	1	*	0-.5 cm	None	No control sample
2	2	1	7-10.5 cm	1 flaked-lithic artifact	None
2	2	2	9.5-12 cm	1 flaked-lithic artifact	1 ^{14}C sample
2	2	3	9-31 cm	None	None

* Excavated as a single stratigraphic layer.

Test Unit 1

Test Unit 1, at the northwestern end of the site, was excavated in three levels within a single layer to bedrock. Bedrock was encountered between 23 and 34 cm below the ground surface. The datum was in the northwest corner (120.25 mN, 103.08 mE, 0.435 mbsd), and the control sample was taken from the northwest corner as well. Sediments consisted of sand with silt. Coarse sand- to pebble-size decomposed sandstone was common in the unit. These sediments continued to bedrock without any major sedimentary differences that would necessitate making a layer change. There were no artifacts recovered from this unit.

Four strata were recognized in the west (east-facing) and in the north (south-

facing) wall profiles. These four strata are illustrated in Figure 16.4 and are described below.

Stratum I — Stratum I is a thin (2 - 7 cm) layer of loose sandy topsoil. There is no A soil horizon here. The stratum is a grayish brown to brown (10YR 5/2 to 5/3) sandy loam. There is no soil structure in this stratum. The lower boundary is abrupt and wavy. Coarse sand to pebbles account for between 15% and 20% of the matrix. These sediments result from the weathering of sandstone bedrock. The sediments do not reach to hydrochloric acid. No artifacts were recovered from this stratum.

Stratum II — Stratum II is a thin (4 - 8 cm) layer of dark yellowish brown (10YR 4/6) loamy sand. The soil structure is angular blocky and moderately developed. This stratum contains a greater proportion of silt than the overlying stratum, and the sand is slightly coarser. The lower boundary is clear to diffuse and gradual. There are some roots in the stratum. Sandstone pebbles from disintegrating sandstone account for less than 10% of the matrix. The sediments in this B soil horizon do not react to hydrochloric acid. Artifacts did not occur in the stratum.

Stratum III — Stratum III is a dark-brown (10YR 4/3) sand. It is approximately 8 to 17 cm thick. The soil structure is subangular blocky and weakly developed. The lower boundary is clear and undulating. Coarse sand- to pebble-size disintegrated sandstone accounts for about 20% of the matrix. The silt content has lessened from the overlying layers. The sediments react violently to hydrochloric acid. No artifacts were found in this stratum. This stratum may represent a Bk horizon or a C horizon.

Stratum IV — Stratum IV is decomposing sandstone bedrock. Sediments in the stratum react violently to hydrochloric acid. The lower boundary remains concealed. This stratum represents the Cr horizon.

Test Unit 2

This unit was placed in the southwestern portion of the site slightly upslope from the main artifact concentration and within an area where sediment build-up was believed to be great enough to contain buried cultural deposits. The datum was located in the southwest corner (95.44 mN, 109.56 mE, 1.137 mbsd), while the control sample was collected from the southeast corner. The unit was excavated in two layers to a final depth of between 28.5 and 51.5 cm below the ground surface. At this depth, decomposing bedrock was encountered across the unit. The thin sod (0 - 0.5 cm) was removed as Layer 1 until the contact with Layer 2, which exhibited an increase in

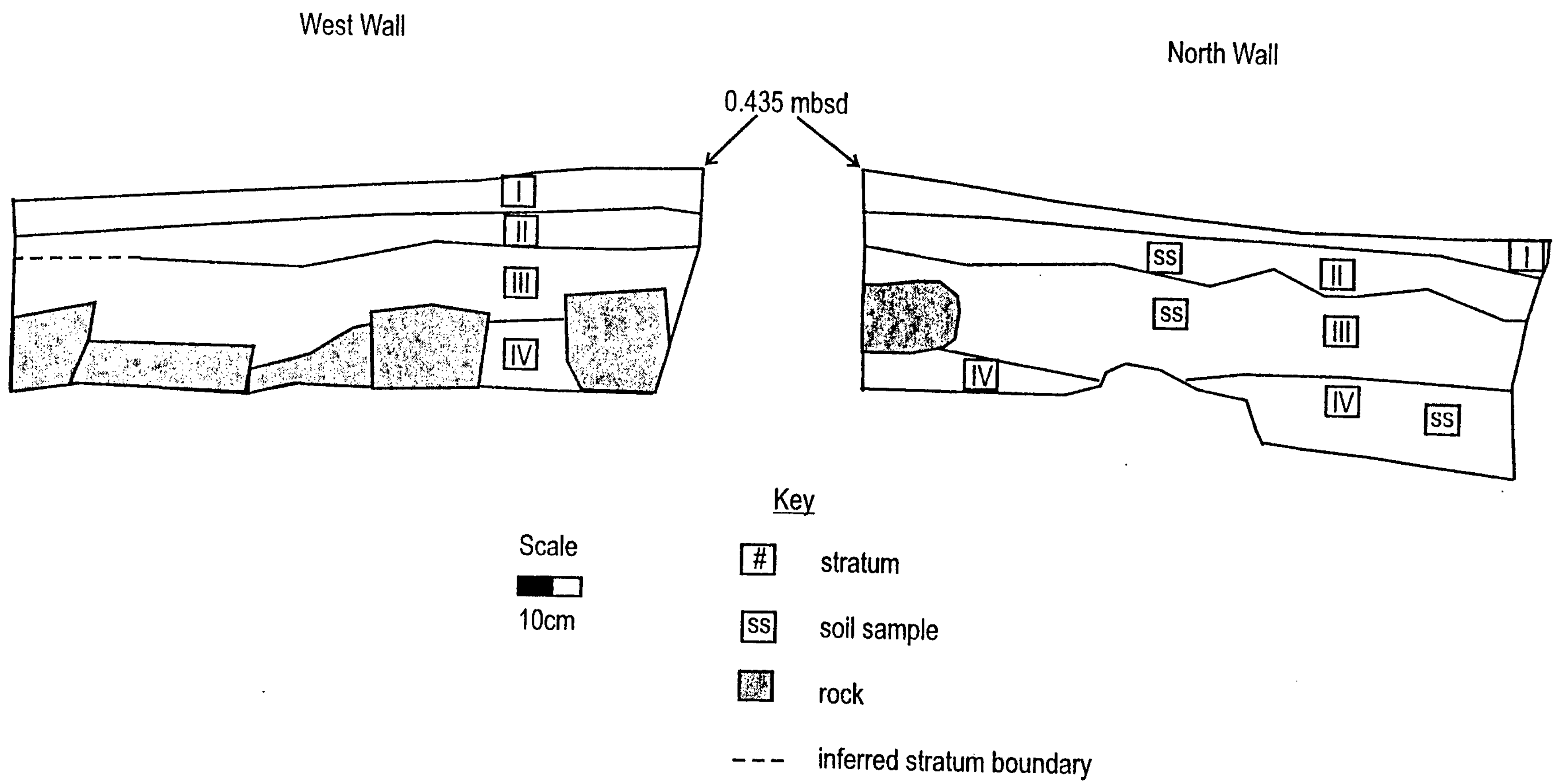


Figure 16.4. West-wall profile and north-wall profile, Test Unit 1, 5PE1809, FCMR.

gravels and roots. Layer 2 was excavated in three levels to the contact with bedrock. Two flakes and a small piece of charcoal were recovered from this layer. Sandstone gravels and cobbles increased throughout Layer 2 until the contact with the sandstone bedrock. Layer 2 was between 28 and 51 cm thick.

Four strata were identified in the east (west-facing) and in the south (north-facing) wall profiles. These strata are illustrated in Figure 16.5, and the descriptions are as follows.

Stratum I — Stratum I is a thin (2 - 5 cm) layer of sod. It is a light brownish gray (10YR 6/2) fine sand. There is no pedogenic structure to this loose layer. The lower boundary is clear and wavy. Roots, plants, and pebbles are present in the layer along with an occasional artifact. Coarse sand and pebble-size sandstone clasts account for less than 1% of the total matrix. Sediments do not react to hydrochloric acid.

Stratum II — Stratum II is a 7-cm-thick layer of brown (10YR 5/3) loamy sand. There is a weak subangular blocky soil structure in the stratum. The lower boundary is clear to diffuse and undulating. There is a slight reaction of the stratum to hydrochloric acid. Roots and rocks are present, and the coarse sand to pebble-size sandstone accounts for between 1% and 5% of the matrix. An occasional artifact was found in Stratum II or at the transition between Stratum II and Stratum III. Sediments are composed mostly of decomposed sandstone. This stratum represents a weak Bk soil horizon.

Stratum III — Stratum III is a yellowish-brown (10YR 5/4) loamy sand. The soil structure is weak, subangular blocky. The lower boundary is clear to abrupt and undulating with the underlying sandstone bedrock. Roots and rocks increase in the stratum. Rocks increase in volume (5% -10%) as well as in size. Sandstone rocks range from coarse sand to cobble size and are byproducts of the decomposing bedrock. The stratum reacts violently to hydrochloric acid. No artifacts were found in this Cr soil horizon.

Stratum IV — Stratum IV is decomposing sandstone bedrock (10% - 15%). Sediments in the stratum react violently to hydrochloric acid. The lower boundary remains concealed. This stratum represents the Cr to R horizon.

Material Culture

A total of 54 artifacts was analyzed. The surface assemblage comprises 44 flakes, 5 cores, a projectile point, a biface fragment, and a mano fragment. The projectile

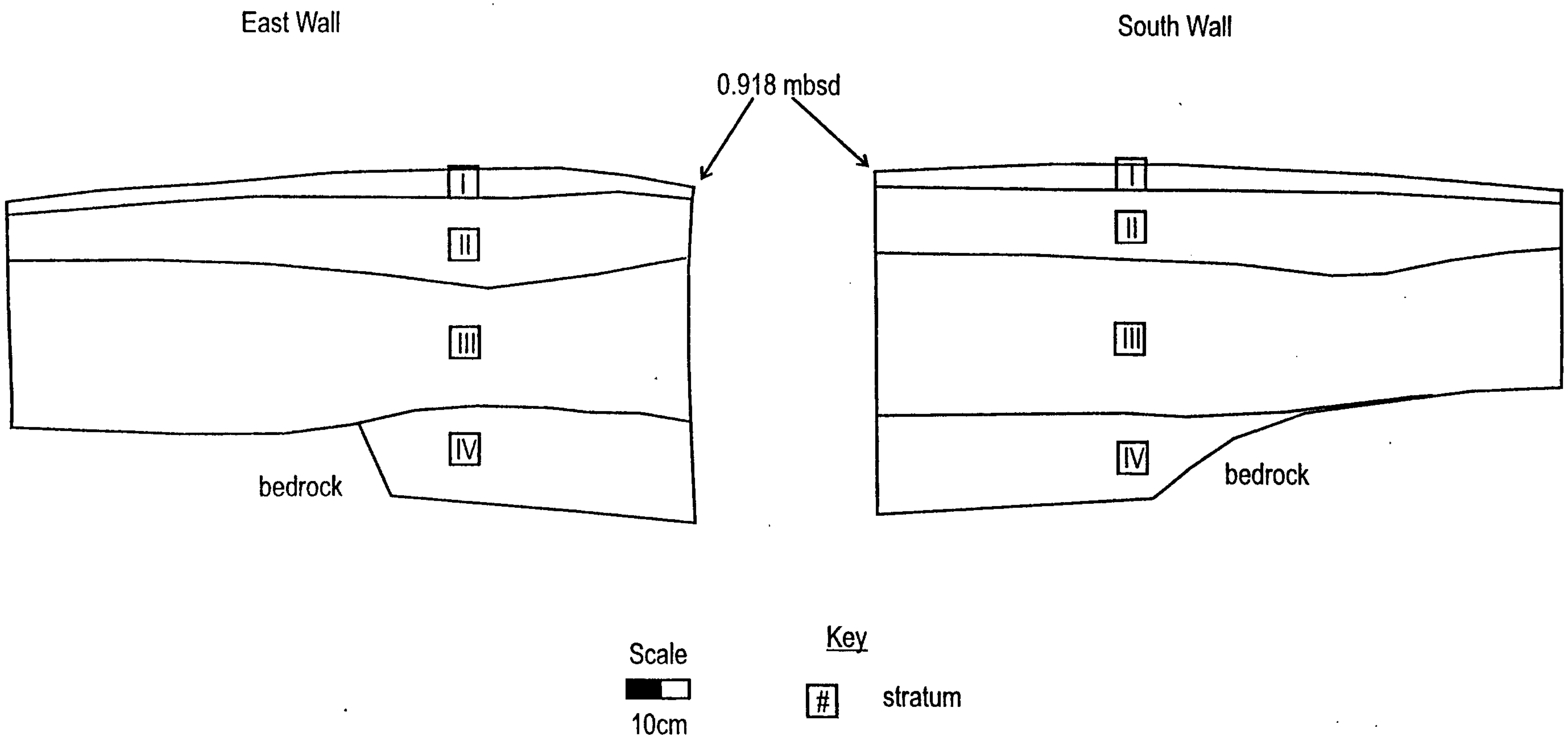


Figure 16.5. East-wall profile and south-wall profile, Test Unit 2, 5PE1809, FCMR.

point and the biface fragment were collected. The mano, the cores, and the flakes were analyzed in the field. Two flakes were recovered from excavations at the site. Quantitative data for the two tools and the cores are presented in Appendix III. Information on the mano fragment is provided in Appendix IV.

Flaked-Lithic artifacts

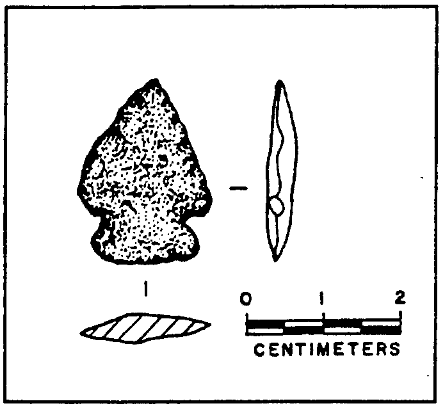


Figure 16.6. Projectile point 5PE1809.1a, FCMR.

The nearly complete projectile point (5PE1809.1a) is manufactured from yellow-brown chert and represents the only diagnostic artifact recovered from the site. The very tip of one shoulder is missing. Morphological characteristics include a sharp tip, a broad triangular blade with straight to slightly convex edges, weakly barbed shoulders, a broad expanding stem, pointed tangs, a slightly convex base, and a biconvex cross-section (Figure 16.6). Examples of similar projectile point types are found at both the PCMS and at the FCMR. Category P35 projectile points from the PCMR (Lintz and Anderson 1989:153) compare favorably with this specimen. This category has a relatively long time span from 1000 BC to AD 1200. Three radiocarbon dates from deposits associated with this point type were obtained from two sites at the PCMS (Lintz and Anderson 1989:155). These samples have dates ranging from AD 780 to AD1100. Projectile point 5PE1809.1a also resembles Type IV/V (Alexander et al. 1982:100; Hartley et al. 1983:140) and Type 5 (Jepson et al. 1992:141) from the FCMR. Using these comparisons as a basis, projectile point 5PE1809.1a probably dates from the Late Archaic through the Diversification periods.

The biface fragment is manufactured from white chert. The biface may have been oval in shape prior to having been broken. This artifact represents a nearly finished, large patterned biface near the final stage of manufacture. The biface is thinned, but impurities in the material prevented further finishing, and these impurities may have caused it to break. The most complete margin of the artifact exhibits evidence of bimarginal utilization.

The five cores are made from local orthoquartzite. The three smallest cores are multidirectionally flaked. One of the two remaining cores has unidirectional flaking and the other has bidirectional flaking. Cortex is present on all five cores.

A total of 46 flakes was analyzed. Interpretations made from this small sample

are limited. The data from the two subsurface flakes are combined with the data gathered in the field on the surface flakes (Table 16.2). Local raw material sources were utilized extensively at the site, with orthoquartzite accounting for three-quarters of the assemblage. Simple flakes are the most common flake type, but relatively high numbers of shatter and complex flakes also occur in the assemblage. A slightly higher percentage of the artifacts have cortex remaining. The flakes are large, with only two of the flakes smaller than ½". Seventy percent are larger than 1".

These flake characteristics suggest that early- to middle-stage reduction activities were occurring at the site. All flake types, with the exception of bifacial thinning flakes, are represented in the assemblage. The high number of large simple flakes with cortex supports the concept of early-stage reduction activities. The occurrence of flakes without cortex, along with a fairly high number of complex flakes, implies that reduction continued beyond the initial stages. Using Sullivan and Rozen's (1985) categories, the comparatively high percentage of broken flakes along with the high number of flake fragments strongly implies that tool production was nearly as common as core reduction activities.

Groundstone

Locally occurring sandstone was used for the mano. This artifact represents roughly half of the mano. Pecking along the edges is a result of shaping and use. Only one surface was smoothed.

Summary and Conclusions

The excavations of two test units and thirty shovel tests produced a total of two flakes. Both flakes are larger than a ½" and both were found in Test Unit 2 between 0 and 20 cm below the ground surface. No artifacts were recovered from the control samples. The small number of artifacts limits the inferences that can be drawn. In general, locally obtainable raw materials were utilized. The site served as a temporary locus of lithic reduction and possibly food processing. Based on previous comparisons, the projectile point dates the site from the Late Archaic through the Diversification periods.

Testing at the site failed to identify a buried cultural deposit. Artifacts are scarce and confined to the surface or near surface context. The site is not recommended as eligible for nomination to the NRHP because so little can be understood about it that it is not possible to determine if specific important research questions can be answered by data contained in the property.

Table 16.2. Surface and subsurface non-tool flaked-lithic debitage, 5PE1809, FCMR.

Material Type	Quartzite/Orthoquartzite				Chert				Chalcedony				Total	
	S	SS	Subtotal	%	S	SS	Subtotal	%	S	SS	Subtotal	%	No.	%
Size Grade														
>1"	26	1	27		3	0	3		4	0	4		34	73.9
1/2" - 1"	6	0	6		0	1	1		3	0	3		10	21.7
<1/2"	1	0	1		1	0	1		0	0	0		2	4.4
Total	33	1	34	73.9	4	1	5	10.9	7	0	7	15.2	46	100
Flake Type (Ahler 1997)														
Shatter	3	0	3		1	0	1		3	0	3		11	23.9
Simple	16	1	17		0	1	1		3	0	3		21	45.7
Complex	14	0	14		3	0	3		1	0	1		14	30.4
Bifacial Thinning	0	0	0		0	0	0		0	0	0		0	0
Total	33	1	34	73.9	4	1	5	10.9	7	0	7	15.2	46	100
Cortex														
Present	19	0	19		2	1	3		5	0	5		27	58.7
Absent	14	1	15		2	0	2		2	0	2		19	41.3
Total	33	1	34	73.9	4	1	5	10.9	7	0	7	15.2	46	100
Flake Type (Sullivan and Rozen 1985)														
Complete	16	0	16		1	1	2		2	0	2		20	43.5
Broken	9	0	9		0	0	0		1	0	1		10	21.7
Flake Fragment	5	1	6		2	0	2		1	0	1		9	19.6
Debris	3	0	3		1	0	1		3	0	3		7	15.2
Total	33	1	34	73.9	4	1	5	10.9	7	0	7	15.2	46	100

S Surface
SS Subsurface

CHAPTER 17
5PE1812

Introduction

Prehistoric site 5PE1812 was originally recorded by FLC during the inventory of portions of Booth Mountain (Charles et al. 1997:6.72-74). It consists of a very small (61 m^2) rock shelter with a bedrock metate and a light scatter of charcoal in the talus cone in the shelter's front. A silicified wood biface at the opening to the alcove was the only surface artifact, aside from the bedrock metate. Two juniper limbs wedged into a hole in the back wall of the alcove were interpreted to be the remains of some type of roof support for a temporary shelter. Other juniper branches were scattered around the alcove opening. A large piece of sandstone that had broken away from the floor of the alcove was used as a bedrock metate. The presence of charcoal in the talus cone suggested the possibility of buried features within the shelter. Roof and wall spall might possibly be covering intact cultural deposits, although packrat disturbance is rather extensive over parts of the alcove.

The site was interpreted to be a small seasonally or temporarily occupied shelter. Among other potential activities at this location, grinding of plant or animal resources was inferred from the presence of the bedrock metate. Because preservation in alcoves and rock shelters is often superior to that of open sites, the site was determined to have excellent potential to yield important information regarding settlement pattern, resource exploitation, and procurement practices of the prehistoric occupants of the FCMR in particular (Zier et al. 1987), and those of the Plains–Mountain transition in general (Eighmy 1984). Therefore, this site was recommended as potentially eligible for nomination to the NRHP.

The site is located along a conglomeritic sandstone escarpment on the west slope of Booth Mountain (Pierce Gulch U.S.G.S. 7.5' quadrangle [Figure 17.1]). The aspect from the site is to the northwest. The alcove is positioned above a steep-sided drainage. The head of the drainage is northeast of the alcove. The alcove measures 9 x 6 m and is approximately 3 m high (Figure 17.2). Elevation of the alcove is 6,080 ft (1,853 m) asl. The slope on which the alcove is located is between 10° and 30° and is mantled with small to large boulders. Sediments within the alcove are a sandy loam derived primarily from mechanical weathering of the sandstone bedrock. Some eolian sediments comprise a minor portion of the sediment matrix. Vegetation surrounding the alcove consists of pinyon, juniper, cacti, sage, some grasses, mullein, and gooseberry. The closest water source is an unnamed ephemeral drainage 30 m north-

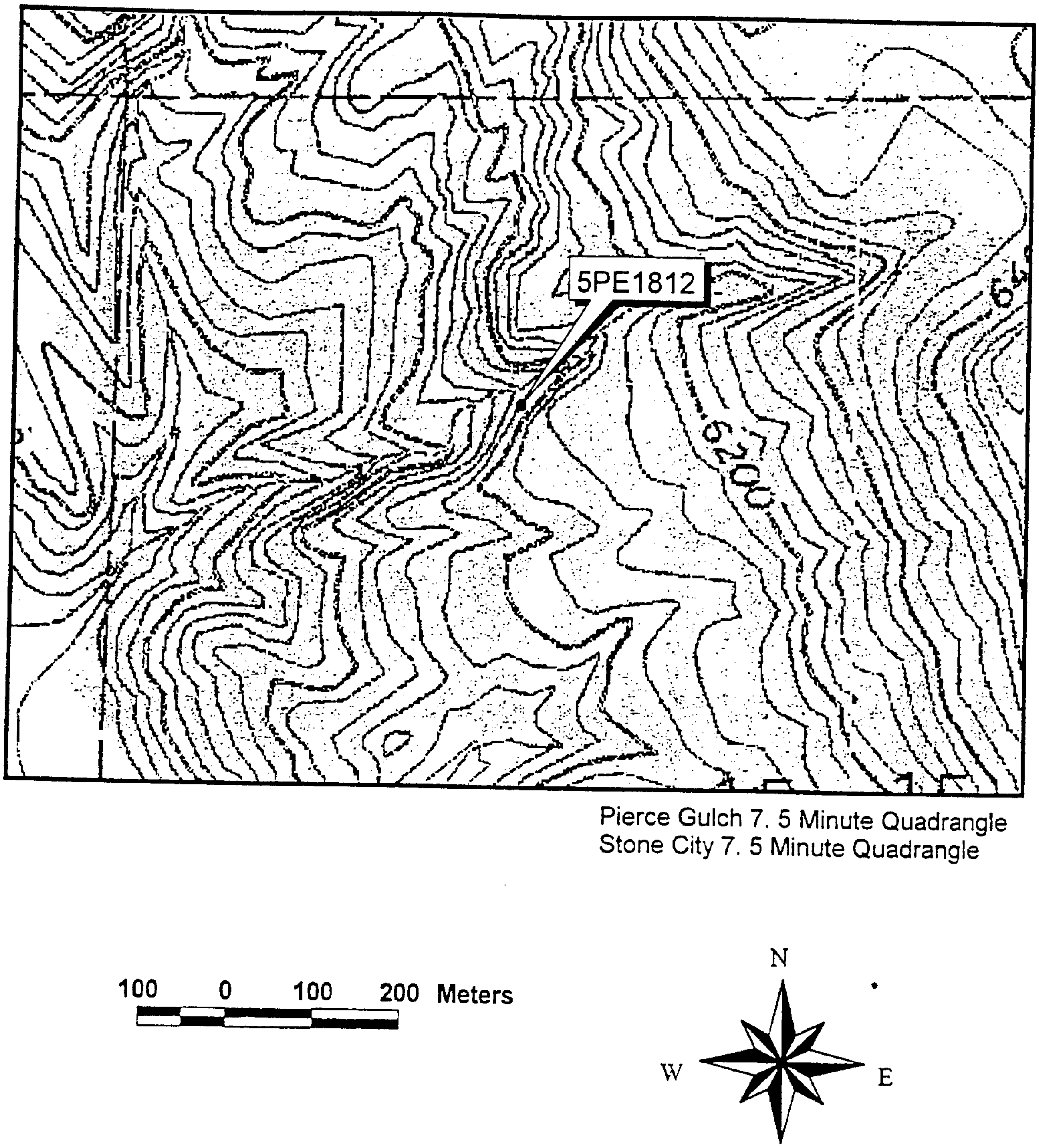


Figure 17.1. Location map, 5PE1812, FCMR

west of the site. Wall and roof spalling of granular to larger angular sandstone is apparent within the alcove, along with a fairly extensive packrat midden. The site does not appear to have been disturbed by humans, but bioturbation has affected the site.

Figure 17.2. Overview of shelter, 5PE1812, FCMR. View is to the south.

Surface Investigations

The small shelter and slope in front were inventoried for surface artifacts. The bedrock metate was analyzed in the field, and the previously recorded biface was collected for further analysis. These were the only surface artifacts observed during the testing phase. Due to the steep slope and poor visibility, the mapping datum was placed north of the original rebar datum in order to gather the appropriate topographic points. Once the site boundary was defined, a map was constructed with the Total Station (Figure 17.3).

Subsurface Investigations

Subsurface investigations included eleven shovel tests and a single test unit.

Shovel Tests

Three lines of shovel tests were placed within the shelter and along the slope in

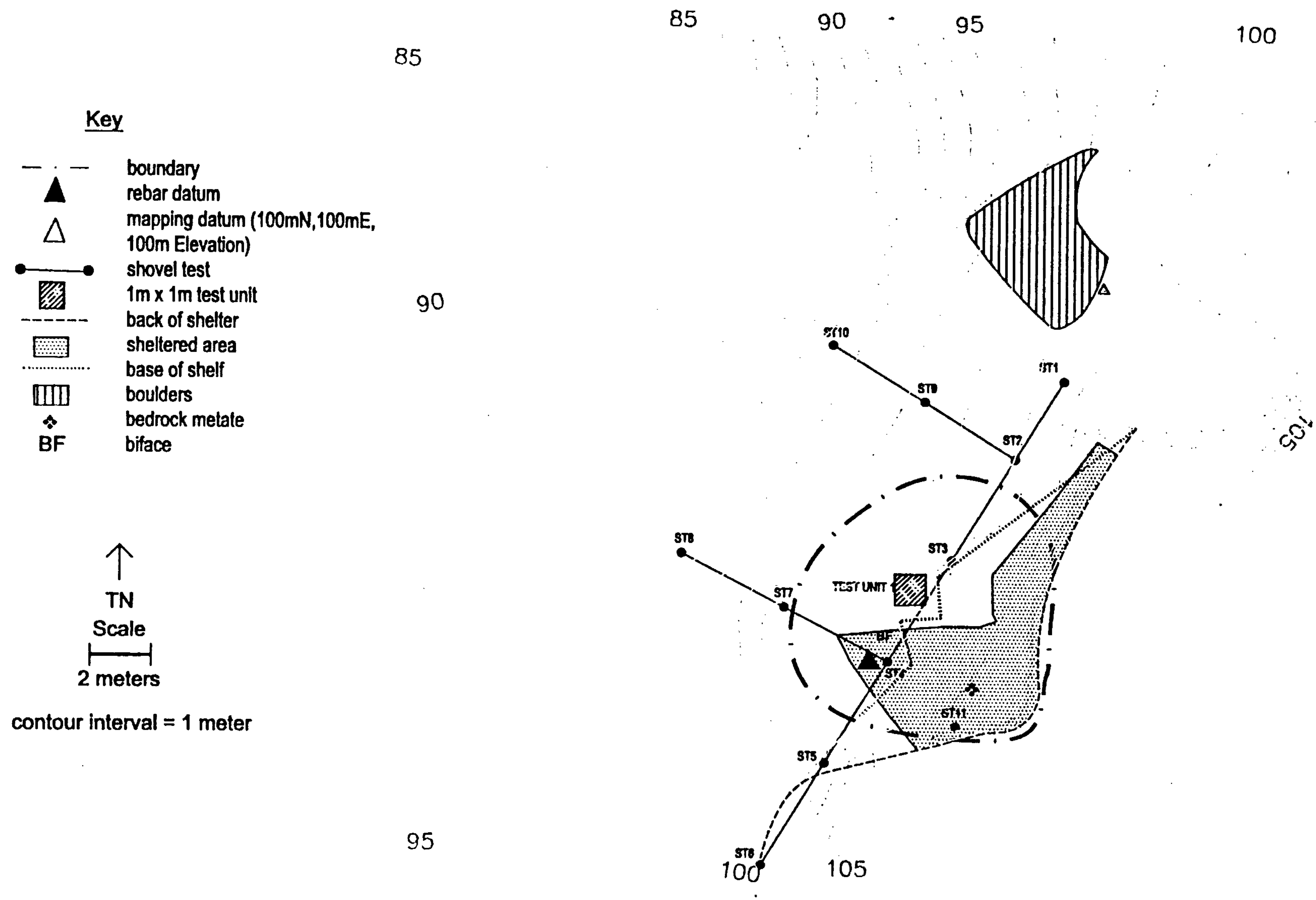


Figure 17.3. Site map, 5PE1812, FCMR.

front and to the northwest of the shelter. Shovel tests were placed a distance of four meters apart. The shovel tests were excavated to culturally sterile sediments, to bedrock, or until the test hole could no longer be excavated with the available equipment (~70 cm). A single line of six shovel tests was placed parallel to the opening of the shelter and ran northeast to southwest. Two shorter lines of shovel tests were placed perpendicular to the first line, intersecting at Shovel Test 2 and Shovel Test 4. A single shovel test was placed in the back of the shelter near the bedrock metate. No artifacts were recovered from the shovel tests. Detailed stratigraphic descriptions of the shovel tests are found in Appendix II.

Test Unit

Due to the extremely small site area, a single test unit was excavated at the site. Test unit results are summarized in Table 17.1.

Table 17.1 Test unit summary, 5PE1812, FCMR.

Test Unit No.	Layer	Level	Thickness Range (bgs)	Materials Recovered 1/4"	1/16" Control
1	1	*	0-4 cm	None	No control sample
1	2	1	0-10 cm	2 flaked-lithic artifacts	1 flaked-lithic artifact
1	2	2	9-16 cm	None	None
1	3	1	7-17.5 cm	None	None

* Excavated as a single stratigraphic layer.

Test Unit 1

Test Unit 1 was placed within a relatively flat area just below and downslope of the dripline. The unit was excavated in three stratigraphic layers. The final depth was between 16 and 42 cm below the ground surface. The datum was placed in the southeast corner (89.40 mN, 94.20 mE, 1.13 mbsd), while the control samples were collected from the southwest corner. Because the test unit was on a slope, the vertical control was taken as the depth below each corner. The first layer was sod, which contained numerous roots, living plants, and rocks. A layer change was initiated when

the sediments became more consistent, and the amount of roots and plants diminished. There were no artifacts recovered from the thin (0 - 4 cm below ground surface) sod layer. Layer 2 was excavated in two levels, and Layer 2 was between 9 and 26 cm thick. The sediments consisted of loose sand with numerous rocks and roots, and the sediments were dark and organic enriched. The rocks are large and resemble talus deposits from the cliff edge to the southeast. Three flakes were recovered from Level 1/Layer 2 along with an occasional charcoal fleck. Small amounts of charcoal continued in Level 2/Layer 2, but no artifacts were recovered form this level. At the bottom of Level 1/Layer 2, the sediments became more brown, and decomposing sandstone began to appear. A layer change to Layer 3 was initiated at this contact. Layer 3 consisted of a brown sand with large rocks and roots. Bedrock was encountered at the bottom of the layer. No charcoal or artifacts were recovered from Layer 3.

Four strata were identified in this test unit (Figure 17.4). Two strata were exposed in the north (south-facing) wall profile. Three strata were exposed in the east (west-facing) wall profile. These strata are described below.

Stratum I — Stratum I is a very thin (0 to 3 cm) layer of dark-brown (10YR 3/3) sandy silt loam. The stratum exhibits a weakly developed, subangular blocky soil structure. The lower boundary is clear and smooth. There is a slight reaction of the sediments to hydrochloric acid. Roots, vegetation and rocks are numerous in the stratum, but no artifacts were recovered. The estimated percentage of gravel-size inclusions is about 1%. This stratum represents a thin O soil horizon.

Stratum II — Stratum II is a thick (15 to 35 cm) layer of sandy silt loam. It is very dark-brown (10YR 2/2) and organic enriched. The soil structure is weakly developed and angular blocky. The lower boundary is clear and undulating. Sediments react slightly to hydrochloric acid. Roots are plentiful in the stratum, and charcoal and an occasional artifact also occur. The percentage of gravel increases to 10%. This stratum represents an A soil horizon.

Stratum III — Stratum III is decomposing sandstone bedrock. The sediments are reddish yellow (7.5YR 6/6) and have a sandy loam texture. The lower boundary is abrupt and undulating with the underlying sandstone bedrock. Gravels decrease to about 1% of the total matrix. The sediments react slightly to hydrochloric acid. This stratum is culturally sterile. There is no soil structure in this Cr soil horizon.

Stratum IV — Stratum IV is bedrock ® horizon). This stratum does not appear on the profile illustration.

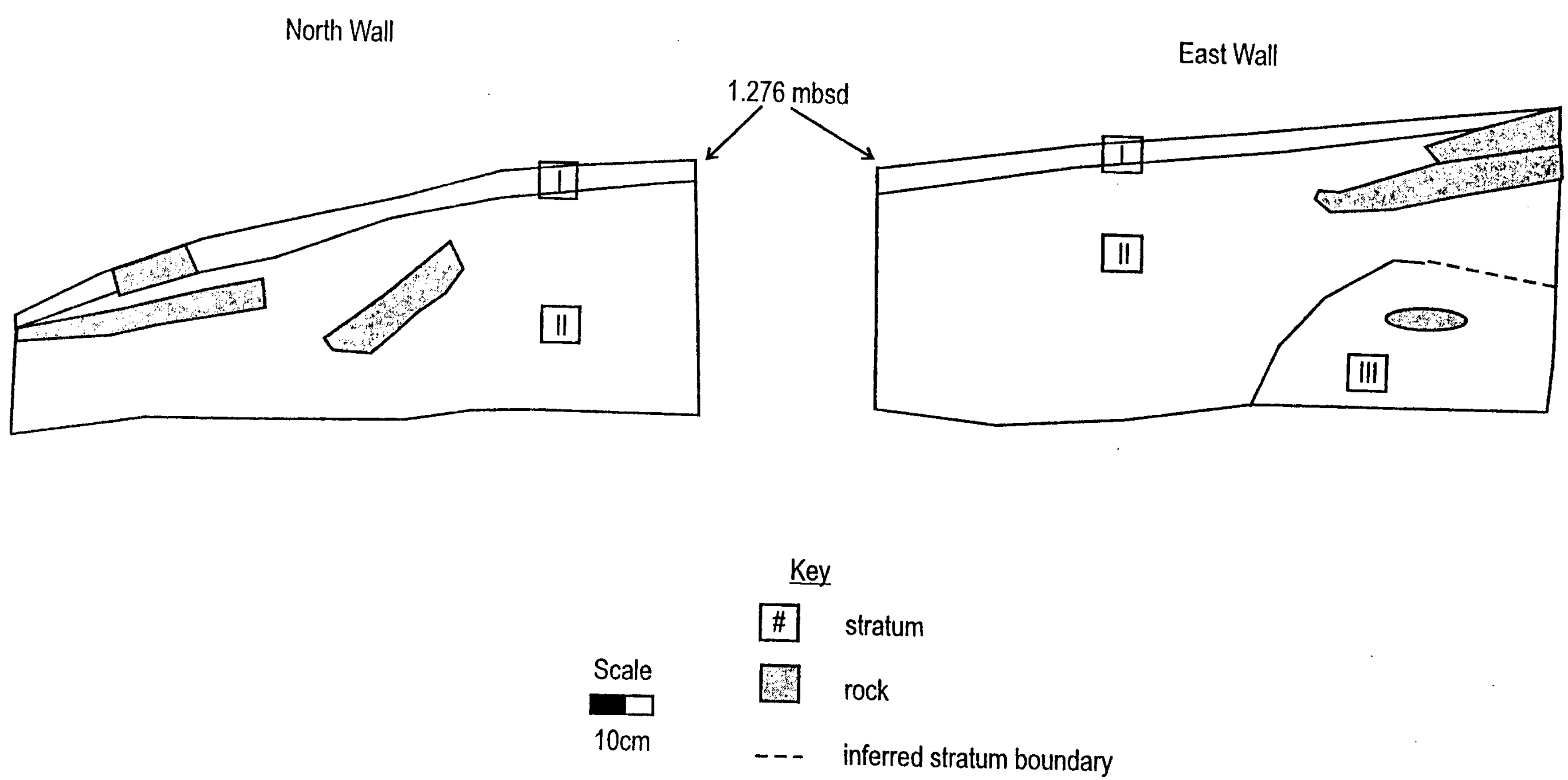


Figure 17.4. North-wall profile and east-wall profile, Test Unit 1, 5PE1812, FCMR.

Material Culture

A total of five artifacts was analyzed. A bedrock metate and a biface represent the only surface artifacts. Both of these artifacts were identified when the site was first recorded (Charles et al. 1997:6.72). The biface was collected, and the metate was recorded in the field. Three non-tool flaked-lithic artifacts were recovered from the test unit excavation. Quantitative information on the biface is presented in Appendix III. Data on the metate are provided in Appendix IV.

Flaked-lithic artifacts

The biface is a large, unfinished, patterned biface in the early stage of manufacture. It is manufactured from a yellow-brown silicified wood and is oval. The artifact is reasonably thick and retains a small amount of cortex. The margins exhibit a very small amount of pressure flaking, but no evidence of utilization.

Two orthoquartzite flakes and one piece of chert shatter were collected from the test unit. Both flakes are simple with cortex. One flake is larger than an inch and the other is larger than a ½". The angular piece of chert, found in the control sample, has no visible cortex and is smaller than a ¼". All three were found in the first level below the sod.

Groundstone

The metate is a shallow basin variety manufactured from a broken piece of the sandstone bedrock. It exhibits multidirectional striations and moderate smoothing but no polish or pecking.

Summary and Conclusions

The small number of artifacts limits the inferences that can be drawn from the overall artifact assemblage, and suggests that the site was only briefly occupied. Locally obtainable raw materials were utilized. The site most likely served as a temporary shelter. No diagnostic artifacts have been recovered from the site, and its cultural affiliation or date of occupation remain inconclusive. Testing at the site recovered few buried artifacts. Two flakes and a piece of shatter were recovered from the test unit, while all eleven shovel tests were culturally sterile. Soil depth is shallow in front of the shelter with little potential for *in situ* buried features or cultural deposits. There is virtually no sediment within the shelter itself. The site is not recommended as eligible for nomination to the NRHP because so little can be understood about it that it is not

possible to determine if specific important research questions can be answered by data contained in the property.

CHAPTER 18
5PE1813

Introduction

5PE1813, a prehistoric open site lacking features, was originally recorded by FLC during the inventory of portions of Booth Mountain (Charles et al. 1997:6.74-76). This flaked- and ground-stone scatter comprises an area of 1,106 m². The surface artifact assemblage included five manos, four cores, two bifaces, two choppers, two scrapers, a hammerstone, a core fragment, and a metate. The entire assemblage of flaked-lithic artifacts was analyzed.

The site was interpreted to be a locus of lithic reduction and food preparation, perhaps with an emphasis on vegetal processing. It was suggested that the site had the potential to yield significant information on the prehistoric utilization of resources on Booth Mountain. The presence of so much groundstone on the surface—which is unusual for a site on Booth Mountain—implied that features associated with grinding activities may lay buried in the site matrix. The site was recommended eligible for nomination to the NRHP because of the potential for the site to yield significant information important to the prehistory of the FCMR in general (Zier et al. 1987) and to the research domains outlined by Eighmy (1984) for the Colorado Plains. Specifically, the site could contribute to an understanding of resource exploitation and procurement within the Plains/Mountain Transition.

The site is located on Booth Mountain (Pierce Gulch U.S.G.S. 7.5' quadrangle [Figure 18.1]). It is positioned in an open area along the gentle southeasterly slope (2°) of a northeast–southwest trending ridge that parallels a large ephemeral drainage. The site is on the west side of this drainage at an elevation of 5,960 ft (1,817 m) asl. Sandstone outcrops behind the site to the north and to the east. The site is centered around three large boulders. Aspect is to the southeast. It is within a thick pinyon and juniper woodland (Figure 18.2). Vegetation other than pinyon and juniper is sparse but includes grasses, cacti, narrow-leaf yucca, mountain mahogany, and buckwheat. The site matrix consists of a gravelly loamy sand, which is derived from the residual weathering of the sandstone bedrock. The sediments are transported to the site through colluvial and alluvial processes. The site is dissected by several small gullies; lithic artifacts are found in the gullies and in deflated areas. This suggests that erosion is compromising the site's integrity.

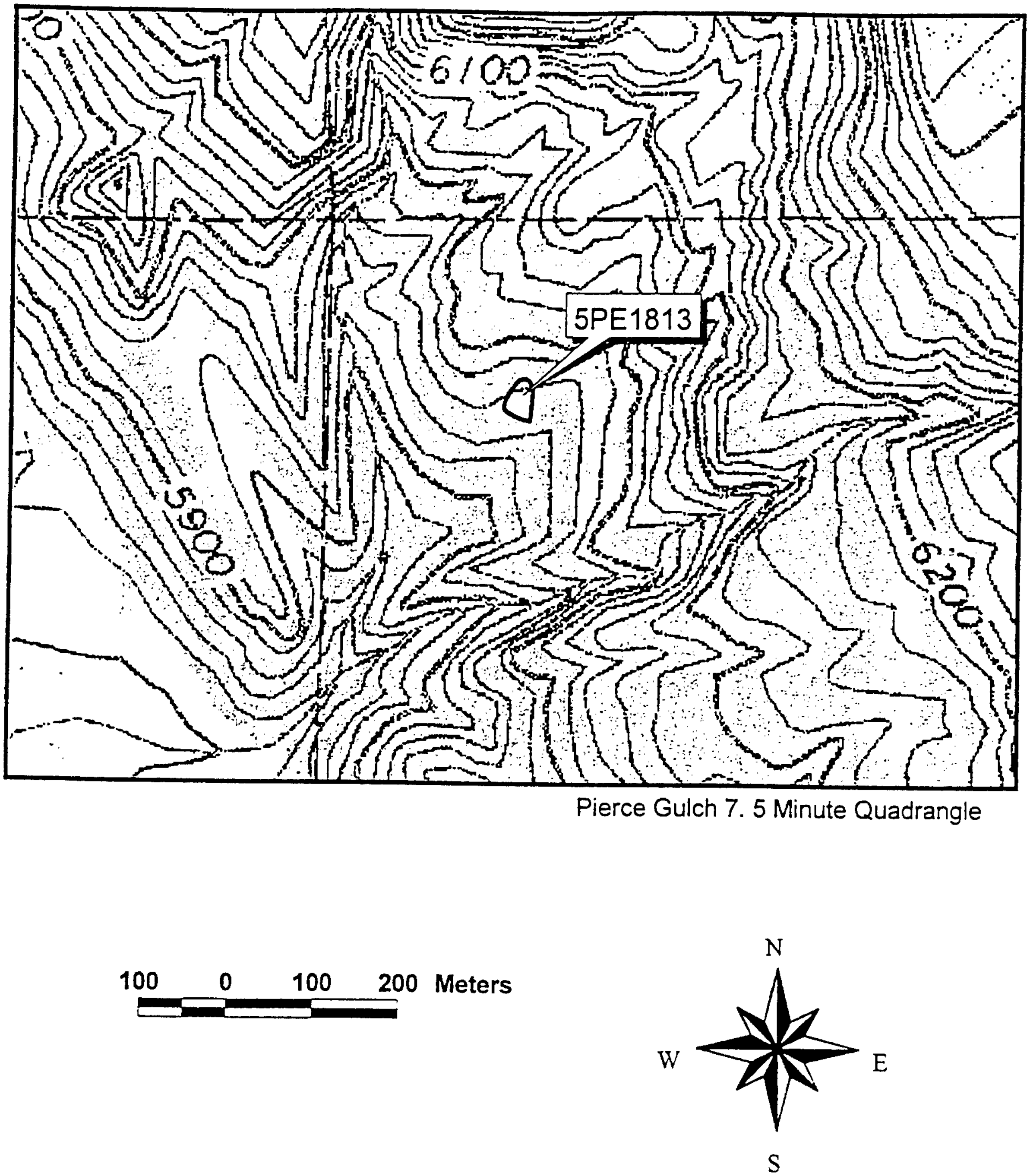


Figure 18.1. Location map, 5PE1813, FCMR.

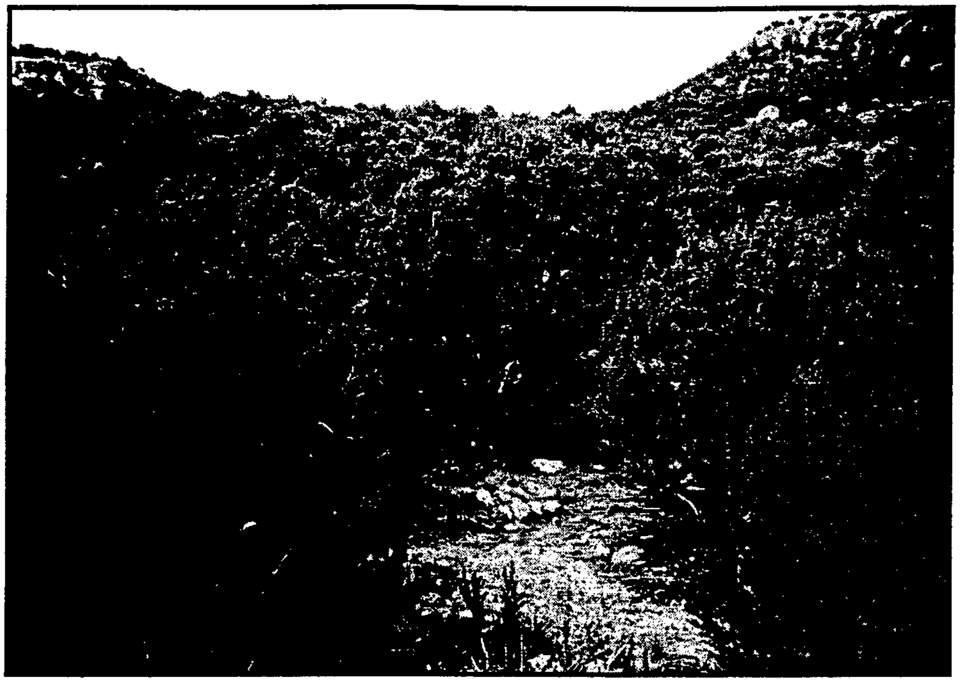


Figure 18.2. Overview of site, 5PE1813. View is to the northeast.

Surface Investigations

The site area was intensively inventoried and all artifacts were flagged. Thirty-three flakes were analyzed in the field, along with seventeen cores and a metate. Artifacts collected for further analysis included six manos, three bifaces, two retouched flakes, and one scraper. After defining the site boundary, survey points were taken with a Total Station, and a site map was generated (Figure 18.3).

Subsurface Investigations

Twenty-four shovel tests and two test units were excavated at the site.

Shovel Tests

The 24 shovel tests excavated at this site were placed in 5 lines across the length and width of the site. Shovel tests were placed a distance of 4 m apart. The shovel tests were excavated to culturally sterile sediments, to bedrock, or until the test hole could no longer be excavated with the available equipment (~70 cm). The first line of shovel tests ran most of the length of the site from south to north. Eleven shovel tests were excavated along this line. A second line was placed perpendicular to the first line, intersecting at Shovel Test 10. Five shovel tests were excavated in this line. A third line was located in the far western edge of the site, and this line ran parallel to the site's

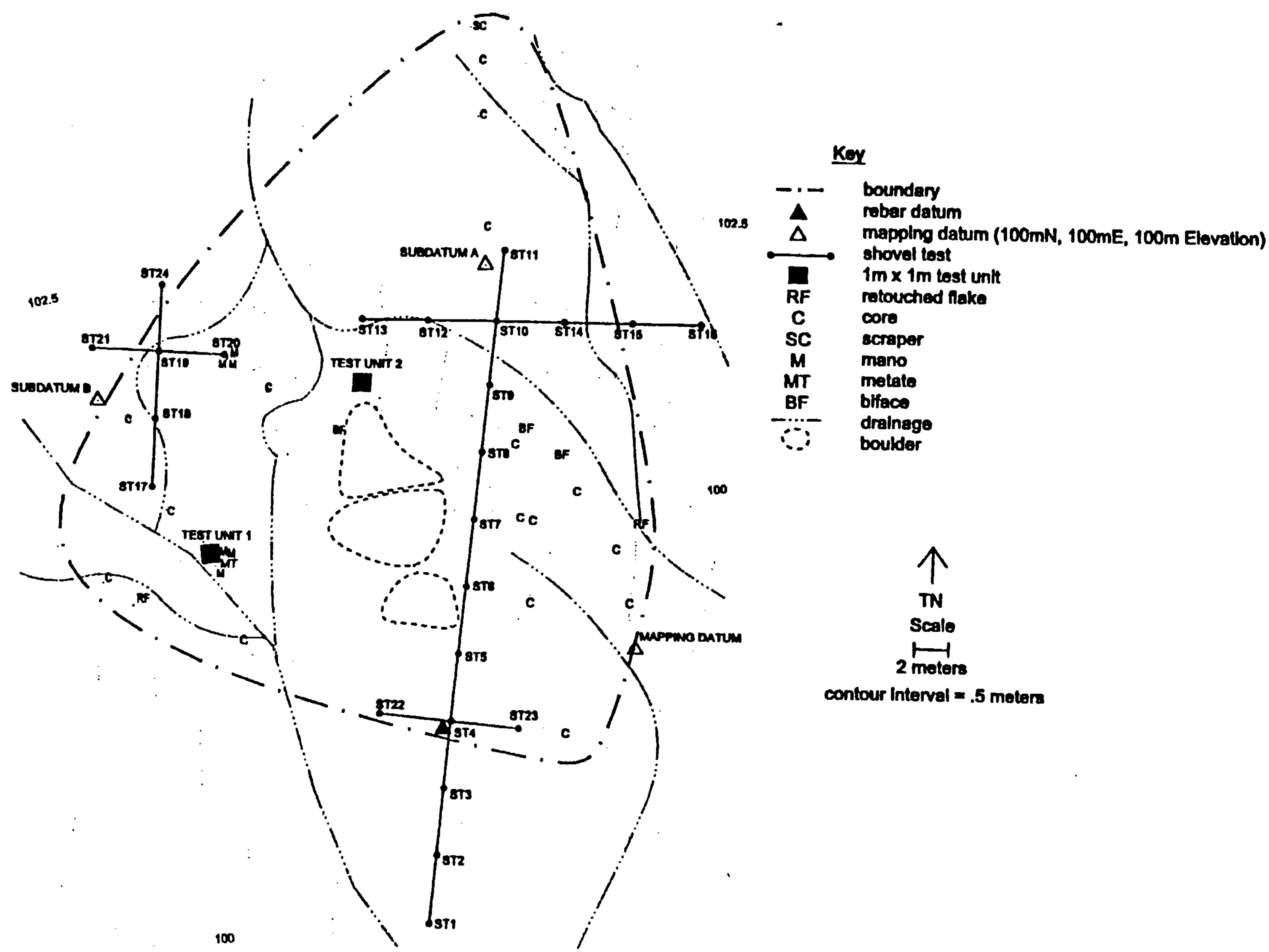


Figure 18.3. Site map, 5PE1813, FCMR.

length. Four shovel tests were excavated along this line. A fourth line of two shovel tests were placed perpendicular to this line, intersecting at Shovel Test 19. Finally, two shovel tests were placed perpendicular to the first line at Shovel Test 4. Two of twenty-four shovel tests (8%) recovered buried artifacts. Detailed stratigraphic descriptions of the shovel tests are provided in Appendix II.

Test Units

Two test units were excavated at this site. Test Unit 1 was placed in a cluster of groundstone artifacts near the western extent of the site. A second test unit was placed upslope and behind a large talus boulder. Results of the test unit excavations are summarized in Table 18.1.

Table 18.1. Test unit summaries, 5PE1813, FCMR.

Test Unit No.	Layer	Level	Thickness Range (bgs)	Materials Recovered 1/4"	1/16" Control
1	1	*	2-8 cm	1 retouched flake	No control sample
1	2	1	0-10 cm	None	1 flaked-lithic artifact
1	2	2	10 cm	Charcoal sample	1 flaked-lithic artifact
1	2	3	10 cm	None	None
1	2	4	10 cm	None	None
1	3	1	10 cm	None	Seeds
2	1	*	2.5-5.5 cm	None	No control sample
2	2	1	6-11 cm	None	Seeds
2	2	2	8.5-10 cm	None	None
2	2	3	8.5-11 cm	None	Seed

* Excavated as a single stratigraphic layer.

Test Unit 1

Test Unit 1 was placed near a group of ground-stone artifacts, which included three manos and a metate. It was believed that there could be buried deposits in the area of the groundstone. The unit was excavated in three layers. The final depth of the unit was between 42 and 57 cm below the ground surface. The datum was in the

northeast corner (108.25 mN, 75.41 mE, 1.345 masd). The control sample was excavated from the northeast corner as well. The top layer consisted of loose sediments mixed with plants and humus from the nearby tree. This thin (2 to 8 cm) layer was excavated as a single layer, and one retouched flake was recovered from this layer. Layer 2 was initiated when the sediments become lighter brown and firmer. Four levels were excavated in Layer 2. Layer 2 contained small roots and coarse sand to cobble-size rocks and gravels. Predominately the gravels were sandstone and quartzite, with some chert and quartz from the eroding conglomeritic sandstone. A few flecks of charcoal were noted throughout the layer. Although no artifacts were recovered from the ¼" screen, two flakes were found in the waterscreen samples in the laboratory. Both artifacts occur in the upper half of the layer. A layer change was made at the contact with a lighter brown soil that had greater compactness and increased calcium carbonate. The total depth for Layer 2 was between 32 and 47 cm below the ground surface. One level was excavated in Layer 3 before excavations were terminated. The last 30 cm of excavation contained no artifacts.

Four strata were defined in the north (south-facing) and in the east (west-facing) wall profiles. These strata are illustrated in Figure 18.4, and they described below.

Stratum I — Stratum I is a thin (4 to 8 cm) layer of yellowish-brown (10YR 5/4) loamy sand. There is no soil structure to this loose layer. The lower boundary is clear and wavy. Grasses, humus, and roots are present, along with a sandstone metate. Pebble-size sandstone accounts for between 1% and 3% of the matrix. There is no reaction to hydrochloric acid. This layer represents an A soil horizon. A metate rests on the surface, and a retouched flake was recovered from the stratum.

Stratum II — Stratum II is a brown (10YR 5/3) sandy loam. It ranges in thickness from between 14 and 28 cm. There are strongly developed, angular-blocky peds in the stratum. The lower boundary is diffuse and irregular. Roots and insect krotovina are common in the stratum as well. Sparse charcoal and an occasional flaked-lithic artifact were present. Pebble- to cobble-size sandstone accounts for between 10% and 20% of the matrix. The sediments react violently to hydrochloric acid. This stratum represent a Bk soil horizon.

Stratum III — Stratum III is a light yellowish-brown (10YR 6/4) loamy sand. The stratum is between 14 and 29 cm thick. Soil structure is moderately developed, with subangular blocky peds. The lower boundary is diffuse and irregular. Roots and insect krotovina are common occurrences. Pebble-size sandstone decreases from the overlying stratum, accounting

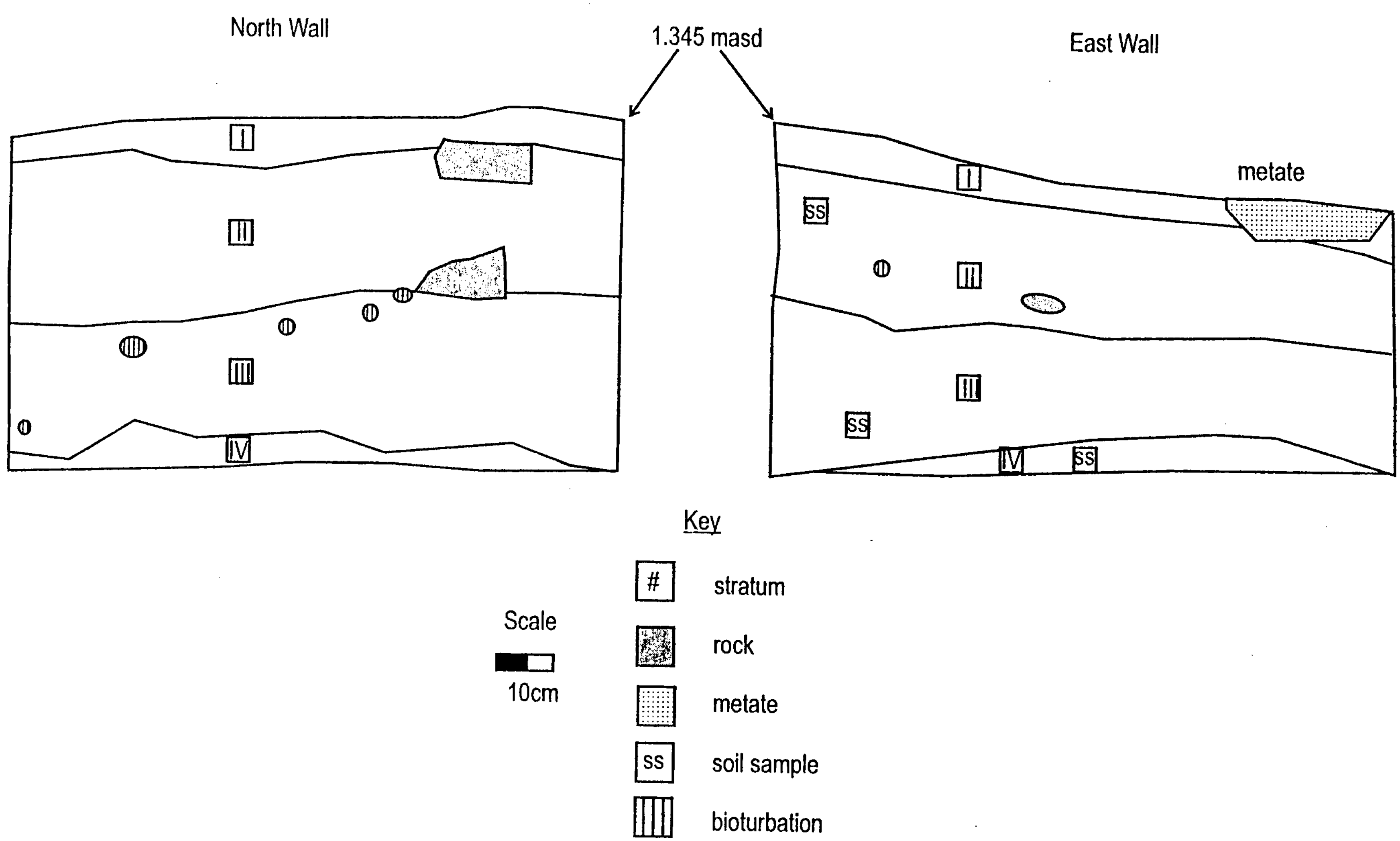


Figure 18.4. North-wall profile and east-wall profile, Test Unit 1, 5PE1813, FCMR.

for between 3% and 10% of the matrix. The sediments react very violently to hydrochloric acid. This stratum does not contain artifacts or charcoal. The stratum represents a cambic B soil horizon.

Stratum IV Stratum IV is a light yellowish brown (10YR 6/4) to white (10YR 8/1) loamy sand. The white color is the result of the increased amount of calcium carbonate in the stratum, which reacts very violently to hydrochloric acid. The stratum possesses weakly developed, subangular blocky peds indicative of some soil development. Roots and insect krotovina remain common in the stratum. Gravels, however, decrease to around 1% of the matrix. The lower boundary remains concealed. No artifacts or charcoal occur in this stratum, which is probably a cambic B soil horizon.

Test Unit 2

Test Unit 2 was placed in the northern end of the site behind a group of large talus boulders. This area provided a good position to explore the possibilities of subsurface deposits; the surface was flat and stable, and sediment build-up was believed adequate to conceal buried cultural deposits. The test unit was excavated in two layers. The final depth reached was between 30 and 34 cm below the ground surface. The datum was located in the northwest corner (118.47 mN, 83.31 mE, 2.18 masd), and the control sample was excavated from this corner as well. No artifacts or other indications of a cultural horizon were found in this unit. Instead, the unit contained roots, rocks, and numerous locust larvae. The topsoil, which ranged between 2.5 and 5.5 cm thick, was removed as Layer 1. This layer consisted of pine needles, prickly pear cactus needles, and a few rocks, but mostly organic materials. A stratum break to Layer 2 was made at the bottom of the humic layer. Three levels were excavated in Layer 2. Layer 2 consisted mostly of a light brown sand with some silt. It was much lighter in color than the overlying humus. Sediment compaction, large tree roots, and gravels increased with depth in the unit. Locust larvae were found throughout this layer. Excavations were terminated after 30 to 34 cm of culturally sterile deposits.

Three strata were identified in the west (east-facing) and in the north (south-facing) wall profiles (Figure 18.5). These strata are described below.

Stratum I Stratum I is a thin (2 to 5 cm) layer of a dark-brown (10YR 3/3) loamy sand. It is matrix supported—well-sorted sandstone gravels account for about 1% of the matrix—with decomposing sandstone and a weakly developed, subangular blocky soil structure. The lower

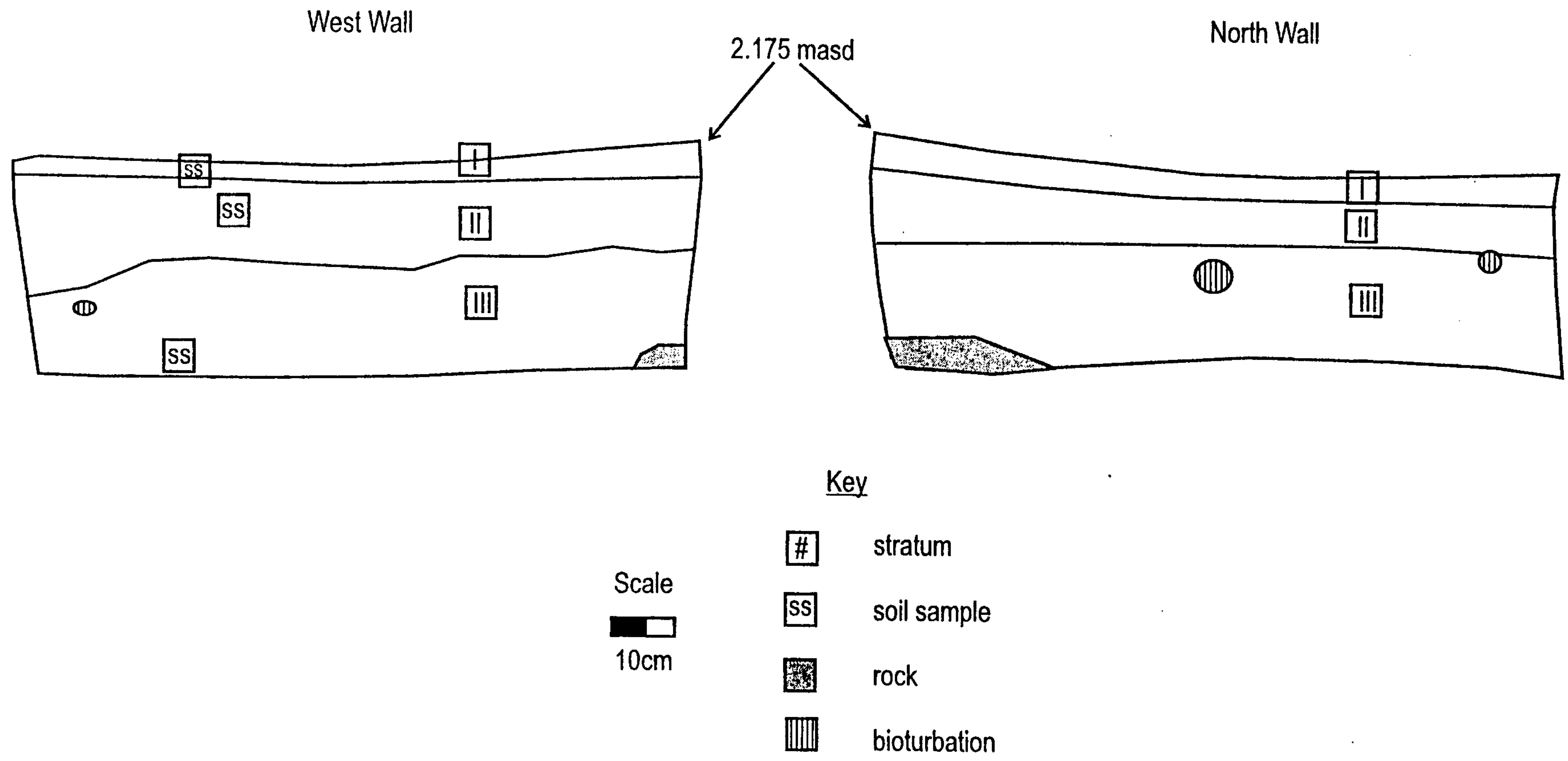


Figure 18.5. West-wall profile and north-wall profile, Test Unit 2, 5PE1813, FCMR.

boundary is clear and smooth. Sediments do not react to hydrochloric acid. There are no cultural inclusions in this stratum. Roots, insect larvae, and krotovina are obvious forms of bioturbation. This stratum represents an A soil horizon.

Stratum II — Stratum II is a 7- to-18-cm thick layer of light yellowish brown (10YR 6/4) silt loam with sand. Gravels increase to between 1% and 3% but remain well-sorted. The lower boundary is smooth and clear. Roots, insect larvae, and krotovina are common in the stratum. Decomposing sandstone begins to appear in the stratum, and no artifacts are present. The stratum reacts moderately to hydrochloric acid. This stratum is a Bk soil horizon.

Stratum III — Stratum III is a pale-brown (10YR 6/3) loamy sand. The soil structure is moderately developed, with angular blocky peds. The lower boundary remains concealed. Roots, insect larvae and krotovina are present in this stratum, and gravels and decomposing sandstone increase. Artifacts continue to be absent. Sediments react violently to hydrochloric acid. This stratum is a Bk soil horizon that may eventually grade to a C or Cr soil horizon.

Material Culture

A total of 68 artifacts was examined. The 63 surface artifacts include 33 flakes, 17 cores, 6 manos, 3 bifaces, 2 retouched flakes, a scraper, and a metate. The flakes, core, and the metate were analyzed in the field. The remaining tools were collected for further analysis. Five artifacts were recovered from subsurface investigations. Two flakes and a retouched flake were recovered from Test Unit 1 excavation. One flake each was recovered from Shovel Tests 4 and 19. Quantitative information on the tools and core is presented in Appendix III. Data on the manos and metate are provided in Appendix IV.

Flaked-Lithic artifacts

Three orthoquartzite bifaces were collected for analysis, two complete and one fragment. The two complete bifaces are oval. The biface fragment is broken roughly in half, but was presumed to have been oval as well. The two complete bifaces represent large, unfinished, patterned bifaces in the early stages of formation. Both artifacts are unthinned and retain small amounts of cortex. These specimens do not display any evidence of edge modification or utilization. The biface fragment is an large, unfinished, patterned biface as well. The fact that this artifact is slightly thinner than the two complete specimens and lacks cortex may indicate that the initial stages of biface

production had been completed before it broke. A few retouched flakes are removed, but there is no evidence of use wear.

The scraper (5PE1813.1b) is manufactured from a yellowish brown silicified wood flake. This complete specimen has patterned unifacial flaking along the thickest edge of the artifact (Figure 18.6). The thickness of the flake was beneficial in the creation of a beveled edge. There is evidence of unifacial use wear along the beveled edge. This tool also exhibits unifacial retouch flaking and unifacial use wear along the lateral margins away from the beveled edge.

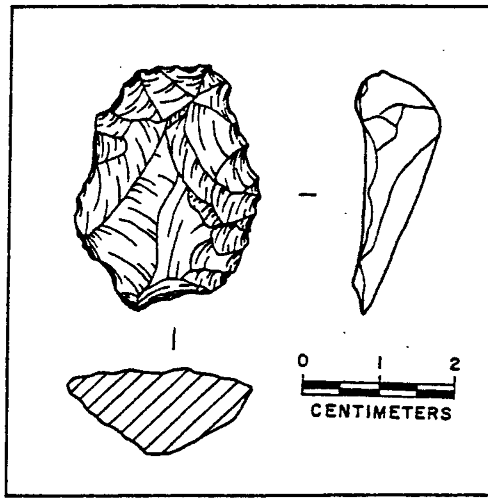


Figure 18.6. Scraper, 5PE1813.1b, FCMR.

The three retouched flakes are made from different raw materials. The largest of these consisted of a large tabular piece of orthoquartzite that exhibits unimarginal retouching along one edge. The other retouched flake found on the surface is a broken chalcedony flake with unimarginal retouching and use wear along most of the unbroken margin. The subsurface flake tool is a thick, complete chert flake with bimarginal use wear and unimarginal retouching along the same lateral margin of the flake.

Seventeen cores were analyzed in the field. The vast majority are either fragmentary or nearly exhausted. All but one of the cores are from the locally available orthoquartzite. Eight of the orthoquartzite cores have evidence of multidirectional flaking, five have bidirectional flaking, and three have unidirectional flaking. The other core, a siltstone core with multidirectional flaking, is the smallest core in the sample.

Generalizations about the non-tool flaked-lithic assemblage are limited by the small sample size. The subsurface data are combined with the data gathered in the field on the surface artifacts (Table 18.2). Local raw material sources were utilized extensively at the site, with orthoquartzite accounting for over half (65%) of the assemblage. Simple flakes are the most common flake type. A low percentage (32%)of the flakes exhibit cortex. Over half of the flakes are larger than 1", with a relatively high percentage of flakes in the next smaller size grade (½" to 1"). Together these size categories represent 84% of the total assemblage.

These flake characteristics are suggestive of middle- to late-stage reduction

Table 18.2. Surface and subsurface non-tool flaked-lithic debitage, 5PE1813, FCMR.

																	Total	
Material	**Quartzite/Orthoquartzite**				**Chert**				**Chalcedony**				**Silicified Wood**				**No.**	**%**
Type	**S**	**SS**	**Subtotal**	**%**	**S**	**SS**	**Subtotal**	**%**	**S**	**SS**	**Subtotal**	**%**	**S**	**SS**	**Subtotal**	**%**		
Size Grade																		
>1"	17	0	**17**		0	0	**0**		1	0	**1**		2	0	**2**		**20**	*54.1*
1/2" - 1"	4	1	**5**		1	0	**1**		2	0	**2**		3	0	**3**		**11**	*29.7*
<1/2"	1	1	**2**		1	1	**2**		1	1	**2**		0	0	**0**		**6**	*16.2*
Total	**22**	**2**	**24**	*64.9*	**2**	**1**	**3**	*8.1*	**4**	**1**	**5**	*13.5*	**5**	**0**	**5**	*13.5*	**37**	*100*
Flake Type (Ahler 1997)																		
Shatter	0	0	**0**		1	1	**2**		1	0	**1**		1	0	**1**		**4**	*10.8*
Simple	13	1	**14**		1	0	**1**		3	1	**4**		2	0	**2**		**21**	*56.8*
Complex	9	1	**10**		0	0	**0**		0	0	**0**		2	0	**2**		**12**	*32.4*
Bifacial Thinning	0	0	**0**		0	0	**0**		0	0	**0**		0	0	**0**		**0**	*0*
Total	**22**	**2**	**24**	*64.9*	**2**	**1**	**3**	*8.1*	**4**	**1**	**5**	*13.5*	**5**	**0**	**5**	*13.5*	**37**	*100*
Cortex																		
Present	4	0	**4**		1	1	**2**		1	1	**2**		4	0	**4**		**12**	*32.4*
Absent	18	2	**20**		1	0	**1**		3	0	**3**		1	0	**1**		**25**	*67.6*
Total	**22**	**2**	**24**	*64.9*	**2**	**1**	**3**	*8.1*	**4**	**1**	**5**	*13.5*	**5**	**0**	**5**	*13.5*	**37**	*100*
Flake Type (Sullivan and Rozen 1985)																		
Complete	2	1	**3**		0	0	**0**		0	0	**0**		0	0	**0**		**4**	*10.8*
Broken	8	0	**8**		0	0	**0**		2	0	**2**		1	0	**1**		**11**	*29.7*
Flake Fragment	12	1	**13**		1	0	**1**		1	1	**2**		3	0	**3**		**19**	*51.4*
Debris	0	0	**0**		1	1	**2**		1	0	**1**		1	0	**1**		**3**	*8.1*
Total	**22**	**2**	**24**	*64.9*	**2**	**1**	**3**	*8.1*	**4**	**1**	**5**	*13.5*	**5**	**0**	**5**	*13.5*	**37**	*100*

S Surface
SS Subsurface

activities. The high number of large, simple flakes without cortex supports this conclusion. According to Sullivan and Rozen's (1985) classification, the high percentage of flake fragments combined with the number of broken flakes strongly imply that tool production was the principal activity at the site.

The presence of a number of reduced cores supports the conclusion that core reduction occurred at the site. Some of the cores may have been prepared elsewhere, based on the small number of flakes with cortex. Subsurface testing at the site confirms that the artifacts are primarily limited to the surface. Test Unit 1 and Shovel Test 4 and 19 produced the only subsurface artifacts. The artifacts found during shovel testing were at shallow depths of 10 to 15 cm below the ground surface. In Test Unit 1, three flaked-lithic artifacts were recovered at different depths between the surface and 27 cm below the ground surface. The metate, exposed on the surface, and a retouched flake were recovered from the initial sod layer. The other two artifacts were found in the upper half of the second layer. These two flakes were recovered from control samples, and were large enough to have been recovered using the conventional ¼" mesh. The absence of small debitage in the control samples or at the site as a whole suggests that smaller flake types such as thinning or resharpening flakes are not present at the site. The three bifaces are unfinished, and the remaining tools represent expedient forms. These characterizations further suggest that core reduction was a more common activity at this site than late stage reduction activities such as tool manufacturing.

Groundstone

One metate and six manos were identified at the site. Data were collected on the metate, which was left in the field. This complete metate is oblong-shaped and manufactured from a tabular piece of sandstone. It was in close proximity to three manos, which were collected. The entire surface of the metate has light pecking around a shallow smoothed depression.

Six complete manos were collected from 5PE1813. Each mano displays battering around the edges. The manos were pecked into their present shape from fine- to coarse-grained sandstones. Four of the manos have a single use surface, while the remaining two are double-sided. The dominant stroke used on the stones is reciprocal rocking, but the second use surface on the double-sided manos was probably from a circular-rocking stroke. Caliche is present on one mano.

Summary and Conclusions

The small number of artifacts limits the inferences that can be drawn from the

overall artifact assemblage, but the variety of artifacts indicates that core reduction and food processing activities occurred at the site, and that locally obtainable raw materials were utilized. The manos and the metate may have been cached at this location for later use. This suggests that the site may have been visited on a seasonal basis. No diagnostics artifacts have been recovered from the site. The single charcoal sample was not analyzed due to the small sample size and lack of a cultural horizon. Therefore, the date of site occupation remains inconclusive. Subsurface testing clearly demonstrated that the site has little potential for subsurface deposits. Artifacts are shallowly buried if they are buried at all. Subsurface features or buried cultural units were not identified. The site is not considered eligible for nomination to the NRHP because so little can be understood about it that it is not possible to determine if specific important research questions can be answered by data contained in the property.

CHAPTER 19
MANAGEMENT RECOMMENDATIONS

Over the 1999 field season at FCMR, FLC conducted site evaluations at 13 archeological resources. Six of these sites are prehistoric open sites lacking features, four sites are associated with small rock alcoves or shelters, two sites are prehistoric open architectural sites, and one site is a prehistoric open hearth site. Evaluative testing by FLC concluded that five of the thirteen sites tested have the potential to yield significant information on the prehistoric themes of the FCMR as presented in the CRMP (Zier et al. 1997). The methods and techniques used to determine research significance are defined in detail in Chapter 5, Field and Laboratory Methods, and are further detailed in the individual site descriptions in Chapters 6 - 18. Routine procedures on all sites included surface artifact inventory, surface artifact collections, a Total Station survey, photographic documentation, and subsurface testing. The kind and quantity of subsurface tests employed were directed by site-specific circumstances and the need to adequately test the site but not to perform mitigation. Subsurface testing comprised shovel tests and noncontiguous 1-x-1-m grid units. Adequate information was needed to determine whether the subsurface potential of each site was enough to make that site potentially eligible for nomination to the NRHP. Once we had determined the site either eligible or not eligible for recommendation, excavations ceased, whether the units were excavated to culturally sterile sediments or not. The number of subsurface investigations varied considerably among sites (Table 19.1). Some sites required myriad testing, while others required minimal exploration. On 5PE750, because it was so large, portions of the site were selected for subsurface tests rather than the entire site area. In general, it was quicker to determine a site as potentially eligible than as not eligible. In other words, more time was usually spent on sites that were eventually recommended as not eligible than on sites recommended as eligible.

At the completion of the field and laboratory analysis, five sites were determined to possess the ability to yield significant data about the prehistory of the FCMR and are therefore recommended as eligible for nomination to the NRHP. These sites require further protective measures and/or additional data recovery. Summary data are presented in Table 19.1 for each site. In the remainder of this chapter brief summaries are provided for each site evaluated. The discussion is ordered sequentially by site number, not by the order in which they were visited.

Table 19.1. Summary of evaluative testing by FLC, 1999, FCMR.

Site No.	Site Type[1]	Shovel Tests	1-x-1-m Test Units
5EP1080	Prehistoric open hearth site	38	3
5EP1345	Prehistoric sheltered site	17	1
5PE750	Prehistoric open architectural site	25	1
5PE1610	Prehistoric sheltered site	3	1
5PE1785	Prehistoric open site lacking features	29	2
5PE1800	Prehistoric open site lacking features	44	2
5PE1803	Prehistoric open architectural site	52	3
5PE1804	Prehistoric open site lacking features	15	1
5PE1805	Prehistoric open site lacking features	25	2
5PE1807	Prehistoric sheltered site	9	2
5PE1809	Prehistoric open site lacking features	30	2
5PE1812	Prehistoric sheltered site	11	1
5PE1813	Prehistoric open site lacking features	24	2
Total	13	322	23

[1] Site types taken from the *Cultural Resource Management Plan for Fort Carson Military Reservation, Colorado*. Vols. I and VII (Zier et al. 1997).

Table 19.2. Eligibility criteria and management recommendations for sites tested by FLC, 1999, FCMR.

Site No.	Eligibility Recommendation	Evaluative Criteria[2]	Management Recommendation
5EP1080	Eligible	Eligible under Criterion D, 36CFR60, N.R.B. 15. Substantial *in situ* buried deposits, CRMP (Zier et al. 1997).	Fence portions of the site that exhibit buried cultural deposits, data recovery in road cut
5EP1345	Eligible	Eligible under Criterion D, 36CFR60, N.R.B. 15. Stratified multicomponent site, Paleo Indian, Early Archaic periods, CRMP (Zier et al. 1997).	Fence alcove/ rock shelter
5PE750	Eligible	Eligible under Criterion D, 36CFR60, N.R.B. 15. Architectural Early and Middle Ceramic period site, CRMP (Zier et al. 1997).	Fence the portion of the site with standing structures and the rock art
5PE1610	Eligible	Eligible under Criterion D, 36CFR60, N.R.B. 15. Substantial *in situ* buried deposits, CRMP (Zier et al. 1997).	Fence alcove/rock shelter and midden
5PE1785	Not eligible	Not eligible because so little can be understood about it that it is not possible to determine if specific important research questions can be answered by data contained in the property, N.R.B. 15. Artifact scatter is restricted to the surface, CRMP (Zier et al. 1997).	No further work
5PE1800	Not eligible	Not eligible because so little can be understood about it that it is not possible to determine if specific important research questions can be answered by data contained in the property, N.R.B. 15. Artifact scatter is restricted to the surface, CRMP (Zier et al. 1997).	No further work
5PE1803	Not eligible	Not eligible because so little can be understood about it that it is not possible to determine if specific important research questions can be answered by data contained in the property, N.R.B. 15. Artifact scatter is restricted to the surface, CRMP (Zier et al. 1997).	No further work

Site No.	Eligibility Recommendation	Evaluative Criteria[2]	Management Recommendation
5PE1804	Not eligible	Not eligible because so little can be understood about it that it is not possible to determine if specific important research questions can be answered by data contained in the property, N.R.B. 15. Artifact scatter is restricted to the surface, CRMP (Zier et al. 1997).	No further work
5PE1805	Not Eligible	Not eligible because so little can be understood about it that it is not possible to determine if specific important research questions can be answered by data contained in the property, N.R.B. 15. Artifact scatter is restricted to the surface, CRMP (Zier et al. 1997).	No further work
5PE1807	Eligible	Eligible under Criterion D, 36CFR60, N.R.B. 15. Substantial *in situ* buried deposits, CRMP (Zier et al. 1997).	Fence alcove/rock shelter and narrow bench in front
5PE1809	Not eligible	Not eligible because so little can be understood about it that it is not possible to determine if specific important research questions can be answered by data contained in the property, N.R.B. 15. Artifact scatter is restricted to the surface, CRMP (Zier et al. 1997).	No further work
5PE1812	Not Eligible	Not eligible because so little can be understood about it that it is not possible to determine if specific important research questions can be answered by data contained in the property, N.R.B. 15. Artifact scatter is restricted to the surface, CRMP (Zier et al. 1997).	No further work
5PE1813	Not Eligible	Not eligible because so little can be understood about it that it is not possible to determine if specific important research questions can be answered by data contained in the property, N.R.B. 15. Artifact scatter is restricted to the surface, CRMP (Zier et al. 1997).	No further work

[2] Evaluative criteria taken from *How to Apply the National Register Criteria for Evaluation*, National Register Bulletin No. 15 (N.R.B.15) (U.S. Department of the Interior 1995), and from the *Cultural Resource Management Plan for the Fort Carson Military Reservation, Colorado* Vols. I and II [(CRMP) Zier et al. 1997).

Individual Site Evaluations

5EP1080

This large site is on a north–south trending toe slope above Little Fountain Creek near the north end of the base. The site is one of several large open prehistoric sites with features located on the FCMR, but it is one of few near this portion of the base and away from the Turkey Creek drainage. A midden is exposed in the road cut, and features are reported from the road. This dirt road and a fighting position (fox hole) within the site boundary have impacted the site. The site was recorded in 1988 (Jepson et al. 1992) and was reevaluated in 1997 (Charles et al. 1999b). Both times, it was recommended as eligible for nomination to the NRHP.

The 1999 surface inventory included the identification and analysis of 131 flakes, 10 sherds, 4 scrapers, 3 manos, 3 retouched flakes, 2 bifaces, 1 utilized flake, and a projectile point. Also during initial inventory a human burial was discovered along a low terrace above Little Fountain Creek at the northeast site boundary. The burial was reported to DECAM, and was removed by DECAM staff archeologists soon thereafter. A report on the burial will be available under a separate title.

Thirty-eight shovel tests and three 1-x-1-m test units were excavated at the site. Shovel tests were used to discover areas to place test units and to delineate a boundary for the site to facilitate fencing, if the site was determined as a significant resource. Results of the subsurface tests showed sediments at the site in excess of 70 cm; more importantly, a buried cultural stratum was present in many of the subsurface tests. The stratum is identified as a buried layer of dark grayish brown sediments with charcoal, artifacts (including pottery and formal tools), corn, faunal bone, and features (shallow basins and possible post holes). This stratum is identified along the ridge top and on the gentle east-facing slope. Subsurface artifacts include 81 flakes, 7 retouched flakes, 3 utilized flakes, 3 bifaces, 38 bone pieces, and 16 sherds.

Examples of both coiled and mass modeled techniques are present in the ceramic assemblage. As both techniques occur in the sample and as mass modeling predated coiling, it is inferred that this site was either occupied by two noncontemporary groups who practiced separate techniques or was occupied during at a time when coiling was beginning to replace mass modeling as the primary manufacturing technique. Two radiocarbon dates are available from the ethnostratigraphic layer discovered during test evaluations. These samples produced calibrated 2-sigma radiocarbon ages of 765–665 BP and 1080–695 BP. Temporally diagnostic projectile points and sherds recovered from the site are consistent with types from other sites in the FCMR and the PCMS, where they date from the Developmental to Diversification periods.

Four days were apportioned to evaluate this site.
Eligibility recommendation: This site is determined to be eligible for nomination to the NRHP under Criterion D of 36CFR60; the potential to yield significant archaeological data. The site has been determined to contain significant *in situ* buried deposits and has the potential to yield information on the research themes of chronology and cultural relationships, settlement patterns, the nature of prehistoric economies, horticulture, paleoclimates, and technology and material culture as defined in the CRMP (Zier et al. 1997).
Management Recommendation: Fence portions of the site that exhibit buried cultural deposits.

5EP1345

This site includes a small alcove/rock shelter with midden deposits along a west-facing slope above the Little Turkey Creek drainage. The alcove is narrow and shallow with a slight overhang, much like the Gooseberry Shelter (5PE910) site in the Turkey Creek drainage. The site was recorded in 1990 (Jepson et al. 1992) and was reevaluated in 1997 (Charles et al. 1999b). Both times the site was recommended as eligible for nomination to the NRHP.

A relatively thick scatter of artifacts, including flaked-lithic tools and groundstone, is exposed along the slope in front of the alcove. In 1999, 109 flakes and 4 cores on the surface were mapped and field analyzed, while collected surface artifacts included 6 bifaces, 4 utilized flakes, 3 retouched flakes, 2 projectile points, a core, a scraper, a tested cobble, and a mano.

Seventeen shovel tests were placed along the terrace below the alcove to determine if buried deposits extended onto the terrace. While a few artifacts were recovered from the shovel tests, it is interpreted that they were moved through colluviation from the shelter and associated midden deposit. A single test unit in the shelter identified a buried cultural deposit replete with massive amounts of charcoal, macrobotanical specimens, burned and unburned bone and flaked-lithic artifacts. A plethora of artifacts and samples were recovered from subsurface, primarily test unit, excavations. These include 527 flakes, 10 bifaces, 5 utilized flakes, 1 retouched flake, 3 cores, 490 bone pieces, a piece of mica, and pollen, flotation, and radiocarbon samples.

Once *in situ* buried cultural deposits were clearly identified, excavations were terminated before reaching the vertical extent of the sediments. It is determined that at a minimum there is a meter of sediments in the shelter that could contain buried cultural deposits. To date, a range in projectile points recovered from the site suggests

that human occupation at the site may date as far back as the Paleo Indian period. The base of an Eden point was recovered from a trowel test excavated in 1997 (Charles et al. 1999b). The projectile points and ceramics collected from the site, beginning with the original recording in 1990, date to the Archaic through Diversification periods. The two charcoal samples from the test unit produced radiocarbon ages from 1200 to 900 BP, which is within the Developmental period (Zier and Kalasz 1999).

One day was spent at the site.
Eligibility Recommendation: This site is determined to be eligible for nomination to the NRHP under Criterion D of 36CFR60; the potential to yield significant archaeological data. The site has been determined to contain significant *in situ* buried deposits, and is a stratified multicomponent site with Paleo Indian, Archaic, and Developmental periods represented. It has the potential to yield information on the research themes of chronology and cultural relationships, settlement patterns, the nature of prehistoric economies, horticulture, paleoclimates, technology and material culture, and geomorphology as defined in the CRMP (Zier et al. 1997).
Management Recommendation: Protect and fence the alcove and associated midden deposits.

5PE750

This site is an extensive scatter of flaked-lithic artifacts and groundstone with associated stacked-stone structures on the west slope of Booth Mountain. The site was originally recorded in 1985 (Zier et al. 1987) and was twice reevaluated by FLC (Charles et al. 1999a, 1999b). On all three occasions, the site was recommended as eligible for nomination to the NRHP. The main site area, originally mapped as 5PE750, consists of nine stacked-stone structures, a light artifact scatter, two rock-art panels and a large sink hole where rain and snowmelt collect. Systematic transects were undertaken to determine the horizontal extent of artifacts, thereby establishing the site boundary. A light but expansive scatter was followed over an area of 8 acres, incorporating 2 previously identified sites, 5PE748 and 5PE749. While the three artifact scatters are discrete, artifacts spaced no more than 20 m apart connect the scatters. Therefore, it was decided to include the entire scatter as a single site; map all the different loci, formal tools, and structures, and conduct subsurface testing in areas of artifact concentrations and sediment build-up. During 1999, a sample of 172 flakes, 4 cores, and a metate were field analyzed. Artifacts collected from the surface included 5 projectile points, 4 bifaces, 4 retouched flakes, 2 scrapers, a mano, and a chopper.

Approximately 50% of the entire site surface exhibits exposed bedrock. Bedrock is particularly conspicuous along the site's edge adjacent to the rim in the area of the stacked-stone structures. Subsurface tests were conducted away from the bedrock and

in areas of sediment build up. Sixteen shovel tests and a 1-x-1-m test unit were placed in the area previously identified as 5PE748, while 10 shovel tests were excavated in the area of 5PE749. Results from subsurface testing failed to define either a buried cultural stratum or a paleosol. Artifacts were recovered from both the shovel tests and the test unit in the area of 5PE748, but were distributed unevenly from the present ground surface to a depth 25 cm bgs, with no recognizable clustering or sediment change. The 10 shovel tests in the area of 5PE749 failed to recover any artifacts. A total of 24 flakes and a core were recovered from subsurface testing.

Comparative analysis of the projectile points from the site indicates that it possesses both Late Archaic period and Developmental and/or Diversification period components. The lack of ceramics and the presence of architecture suggest that the site was most likely occupied during the Late Archaic or Developmental periods.

The presence of standing architecture allows us to conclude that the portion of the site originally recorded as 5PE750 is eligible for nomination to the NRHP; therefore, no subsurface tests were placed in the main site area. The structures are on bedrock with some potential for subsurface deposits; however, test unit excavations in the structures would result in virtual mitigation as opposed to testing.

Three days were spent at this site.
Eligibility Recommendation: This site is determined to be eligible for nomination to the NRHP under Criterion D of 36CFR60; the potential to yield significant archaeological data. The site has standing architectural features that date to the Development or Diversification periods. Furthermore, it holds the potential to yield information on the research themes of chronology and cultural relationships, settlement patterns, the nature of prehistoric economies, horticulture, technology and material culture, and architecture as defined in the CRMP (Zier et al. 1997).
Management Recommendation: Sites 5PE748 and 5PE749 should be integrated into site 5PE750 as a single large complex, but protection, in the form of fencing, should be restricted to the area of the standing architecture and the rock art. The remainder of the site is not recommended for fencing. Additionally, we do not recommend fencing around the sink hole, as it is a major source of water for the wildlife.

5PE1610

This site, a small west-facing rock shelter/alcove, is positioned such that it overlooks Pierce Gulch to the west. The site is limited to a single primary alcove and three smaller subsidiary alcoves formed in conglomerate sandstone. The site was recorded in 1993 (Zier et al. 1996) and was reevaluated for significance in 1997(Charles et al. 1999b). Both times it was suggested that the site had the potential to yield

significant information to the prehistory of the FCMR.

A light artifact scatter is present on the site's surface. Three sandstone metates are present in the main alcove. Two metate fragments, six flakes, and a chopper are present on the slope below the shelter. The chopper was the only surface artifact collected. Two previously unrecorded sets of vertical grooves on two boulders adjacent to the shelter's back wall were identified, mapped, and described in 1999. Three shovel tests and a single 1-x-1-m test unit were excavated at the site. Results from the test unit in particular and also from the shovel tests showed an *in-situ* buried cultural stratum with artifacts, heavy charcoal, unburned and burned animal bones, and macrobotanical remains. This layer was encountered at depths ranging from 35 to 44 cm below the ground surface. Admittedly, artifacts were sparse in the layer and included only 25 flakes. Directly beneath the cultural stratum is a buried soil, which implies a stable land surface and a suitable setting for human habitation. This cultural stratum was identified in one of the three shovel tests as well, although no artifacts were recovered from either shovel test. A total of 136 primarily rodent bones were recovered from the subsurface testing, which conclusively demonstrated the presence of a buried cultural stratum (ethnostratigraphic unit). Excavations were terminated after a massive layer of disintegrating sandstone was encountered at 50 cm below the ground surface.

A radiocarbon sample from the ethnostratigraphic layer produced a 2–sigma radiocarbon age of 945–730 BP. This sample suggests a possible occupation during the Diversification period. The site has the potential to yield significant buried cultural deposits with the added potential for additional radiocarbon dates and perhaps diagnostic temporal artifacts.

One day was spent at the site.
Eligibility Recommendation: This site is determined to be eligible for nomination to the NRHP under Criterion D of 36CFR60; the potential to yield significant archaeological data. The site has been determined to contain significant *in situ* buried deposits. It has the potential to yield information on the research themes of chronology and cultural relationships, settlement patterns, the nature of prehistoric economies, horticulture, paleoclimates, technology and material culture, and geomorphology as defined in the CRMP (Zier et al. 1997).
Management Recommendation: Fence and protect.

5PE1785

This site consists of a fairly dense scatter of flakes, flaked-lithic tools and groundstone on a ridge overlooking Pierce Gulch and Booth Gulch. The site was recorded in 1995 (Charles et al. 1997). In 1999, a sample of 161 flaked artifacts were

field analyzed, and all tools (with the exception of a metate fragment and three cores) were mapped and collected. Collected tools include 6 bifaces, 2 utilized flakes, 3 retouched flakes, a chopper, and a hammerstone.

Subsurface testing at the site comprised 29 shovel tests and 2 test units. Results from shovel testing showed sediment build-up adequate to conceal buried deposits, but most of the artifacts found in the tests were found in the first two strata, the duff and the top of the B soil horizon. These test units were excavated to maximum depths of between 36 and 43 cm below the ground surface. In both test units, artifacts were recovered from shallow depths between 0 and 25 cm below the ground surface. The total subsurface artifact assemblage includes 35 flakes, 4 utilized flakes, 1 retouched flake, and 2 bifaces. Surface or subsurface features were not present, and no buried soils or buried cultural strata were recognized. Results from subsurface testing imply that artifacts are confined to the surface or are shallowly buried, and there is little potential for significant buried cultural deposits at the site. There are no diagnostic artifacts recorded from this site.

Two days were spent at this site.
Eligibility Recommendation: The site is recommended not eligible for nomination to the NRHP because so little can be understood about it that it is not possible to determine if specific important research questions can be answered by data contained in the property. Moreover, the artifact scatter is restricted to the surface.
Management Recommendation: No further archeological work.

5PE1800

This site is a large, but sparse scatter of flaked-lithic artifacts located in the interior of Booth Montan. It was recorded by FLC in 1995 (Charles et al. 1997). The 1999 surface inventory identified a total of 40 flakes, a core, a projectile point, a chopper and a scraper. The projectile point is corner-notched, probably dating to the late Developmental or early Diversification periods. The surface artifacts were mapped and field analyzed, while the tools were mapped and collected.

Forty-four shovel tests were placed at the site along with two test units. Sediments at the site are generally shallow in many of the shovel tests, but overall sediment depth was determined great enough to contain buried cultural strata; however, no cultural deposit was identified in any of the subsurface tests. One flake was recovered between 0 and 5 cm below the surface in one of the shovel tests, and no artifacts were recovered from the test units.

Two days were spent evaluating the site.

Eligibility Recommendation: The site is recommended not eligible for nomination to the NRHP because so little can be understood about it that it is not possible to determine if specific important research questions can be answered by data contained in the property. Moreover, the artifact scatter is restricted to the surface.
Management Recommendation: No further archeological work.

5PE1803

This very large open artifact scatter and a single arced stacked-stone feature is located in the interior of Booth Mountain. The site was recorded by FLC during the inventory of portions of Booth Mountain (Charles et al. 1997). The site is within a pinyon–juniper woodland with grassy open areas where most of the artifacts are observed. A sample of 159 flakes were analyzed in the field along with 10 cores and 2 metates during the 1999 field season. Collected tools included 5 utilized flakes, five retouched flakes, and a biface. There have not been any temporally diagnostic artifacts recovered from this site, and therefore temporal affiliation remains inconclusive.

Fifty-two shovel tests along with three test units were excavated in different sections of the site. Artifacts were recovered from four shovel tests and from all three test units. They include 13 flakes, 1 retouched flake, 1 utilized flake, 1 core, and a drill. A definite subsurface cultural stratum or buried soil, however, was not identified in any of the subsurface tests. The majority of the flakes are chalcedony, and the site probably functioned in the capacity of lithic reduction with lesser amounts of plant or animal processing. The stacked-stone feature was mapped and recorded, and there is little potential for the feature or the site to yield additional significant information.

Two field days were spent at the site.
Eligibility Recommendation: The site is recommended not eligible for nomination to the NRHP because so little can be understood about it that it is not possible to determine if specific important research questions can be answered by data contained in the property. Moreover, the artifact scatter is restricted to the surface.
Management Recommendation: No further archeological work.

5PE1804

This small flaked-lithic artifact scatter on the steep north slope of Booth Mountain was recorded in 1995 by FLC (Charles et al. 1997). The 1999 surface inventory resulted in locating 34 flakes and a scraper, which were point provenienced and field analyzed. No diagnostic artifacts were located or collected at the site.

Fifteen shovel tests and a single test unit were excavated during testing.

Sediment depth reached 70 cm below the surface in a quarter of the shovel tests, and the test unit was excavated to a maximum depth of 57 cm below the surface. One flake was recovered between 0 and 10 cm below the surface in a single shovel test, and 7 flakes were recovered from the first 10 cm below the surface in the test unit. Due to the small site size, it is believed that the single test unit and the 15 shovel tests are sufficient to determine the archeological potential of the site. Artifacts are restricted to the surface or near-surface context, and no buried cultural strata were identified.

Two field days were spent at this site.
Eligibility Recommendation: The site is recommended not eligible for nomination to the NRHP because so little can be understood about it that it is not possible to determine if specific important research questions can be answered by data contained in the property. Moreover, the artifact scatter is restricted to the surface.
Management Recommendation: No further archeological work.

5PE1805

The site is located on the steep north slope of Booth Mountain. It consists of a small but dense scatter of flaked-lithic artifacts. The site was recorded during the 1995 inventory of portions of Booth Mountain (Charles et al. 1997). The 1999 surface artifact inventory resulted in the mapping and field analysis of 160 flakes, 7 cores, 2 hammerstones, 2 utilized flakes, a projectile point, and a graver.

Five of twenty-five shovel tests recovered subsurface artifacts. Two test units were excavated in the area of artifact concentrations and in an area with stable sediment accumulation. Test Unit 1 was excavated to a maximum depth of 52 cm below the surface, and no artifacts were recovered from the unit. Test Unit 2 produced artifacts in all but one of the levels, with the majority of artifacts found in the first 10 to 20 cm below the surface. A total of 21 flakes, 4 cores, and a utilized flake were recovered from subsurface tests.

Although the sediment depth at the site is sufficient for buried cultural strata, none were observed. The artifacts are primarily confined to the surface and near-surface context. Because the projectile point was too fragmentary for comparison, the temporal affiliation of the site remains inconclusive.

Two and one-half days were committed to this site.
Eligibility Recommendation: The site is recommended not eligible for nomination to the NRHP because so little can be understood about it that it is not possible to determine if specific important research questions can be answered by data contained in the property. Moreover, the artifact scatter is restricted to the surface.

Management Recommendation: No further archeological work.

5PE1807

This small alcove and open site, with a possible hearth feature, is located on a narrow bench below a larger escarpment within the interior of Booth Mountain. The site was recorded in 1995 by FLC (Charles et al. 1997). Ten flakes and two core fragments were mapped and field analyzed in 1999. A chopper was mapped and collected, which brings the total number of surface artifacts to 13.

Nine shovel tests and two test units were excavated at the site. Sediment depth in the shovel tests ranged from 24 to 71 cm below the surface, providing ample accumulations for buried deposits. Seven of the nine shovel tests produced artifacts, and both test units produced artifacts. The subsurface artifact assemblage includes 43 flakes, 2 cores, a chopper, and a retouched flake. More importantly, a buried stratum (possibly a buried soil) with artifacts, which included tools and charcoal, was identified in both test units and in several of the shovel tests. Artifacts were found at the contact between the buried stratum and the stratum above, and they continued within the stratum itself to a depth of 61 cm below the ground surface. This darker gray stratum, although not excessively rich in cultural material, contains bone, charcoal, and occasional pieces of fire-reddened sandstone. These materials suggest that the stratum is likely an enriched soil horizon containing buried cultural deposits.

Diagnostic artifacts have not been recovered from this site, but two radiocarbon samples, one from each test unit, were processed. The ensuing dates overlap at the 2–sigma significance level and place site occupation between 1565 and 1275 BP and within the Developmental period.

Two days were spent at this site.
Eligibility Recommendation: This site is determined to be eligible for nomination to the NRHP under Criterion D of 36CFR60; the potential to yield significant archaeological data. The site has been determined to contain significant *in situ* buried deposits that date to the Developmental period. It has the potential to yield information on the research themes of chronology and cultural relationships, settlement patterns, the nature of prehistoric economies, horticulture, paleoclimates, technology and material culture, and geomorphology as defined in the CRMP (Zier et al. 1997).
Management Recommendation: Fence.

5PE1809

This open flaked- and ground-stone scatter is within the interior of Booth

Mountain. It was recorded by FLC in 1995 as part of the inventory of portions of Booth Mountain (Charles et al. 1997). The artifacts are most visible in the small, intermittent washes and gullies, that braid between the vegetation. The 1999 transect inventory of the site resulted in locating 44 pieces of flaking debris, 5 cores, a biface, a mano, and a projectile point.

None of the 30 shovel tests excavated recovered subsurface artifacts. Sediment depth in the shovel tests, however, ranged from 5 to 43 cm below ground surface, allowing for the potential for buried deposits. Two test units were excavated to maximum depths between 34 and 51 cm below the surface. Two flakes were the only artifacts recovered from subsurface excavations. The subsurface investigations at this site provided no indication of a buried cultural stratum, buried artifacts, or buried features.

The projectile point is small and corner-notched with an expanded stem and resembles points dated from the Late Archaic to the Diversification periods.

One day was spent testing this site.
Eligibility Recommendation: The site is recommended not eligible for nomination to the NRHP because so little can be understood about it that it is not possible to determine if specific important research questions can be answered by data contained in the property. Moreover, the artifact scatter is restricted to the surface.
Management Recommendation: No further archeological work.

5PE1812

This site is a very small alcove or shelter in the interior of Booth Mountain. It was recorded by FLC in 1995 (Charles et al. 1997). Charcoal along the slope in front of the alcove indicated the potential for buried deposits beneath rock spalls and packrat droppings. A bedrock metate and a chert biface were the only surface artifacts recorded in 1995, and these two artifacts were the only ones noted during the 1999 testing phase.

Subsurface investigations included 11 shovel tests and a single test unit. Three flakes were the only artifacts and were recovered from a shallow depth in the test unit. Sediment accumulation noted in the shovel tests ranges from 7 to 57 cm below the surface, thereby allowing for the potential for subsurface deposits. Sediments are bioturbated, and charcoal found below the surface is suspected of being recent. No diagnostic artifacts were recovered from this site.

Evaluative testing was completed in one day.
Eligibility Recommendation: The site is recommended not eligible for nomination to

the NRHP because so little can be understood about it that it is not possible to determine if specific important research questions can be answered by data contained in the property. Moreover, the artifact scatter is restricted to the surface.
Management Recommendation: No further archeological work.

5PE1813

5PE1813 is a diffuse scatter of flaked-lithic artifacts and groundstone on a site along the west slope of Booth Mountain. The site was recorded in 1995 during the inventory of portions of Booth Mountain (Charles et al. 1997). Artifacts are commonly visible in the numerous small erosional channels that dissect the site. The 1999 surface inventory was conducted in transects and resulted in the following assemblage: 33 flakes, 17 cores, 6 manos, 3 bifaces, 2 retouched flakes, a scraper, and a metate. This artifact assemblage suggests a range of prehistoric behaviors.

Twenty-four shovel tests, ranging in depth from between 16 and 72 cm below the surface, indicated that the site has enough sediment accumulation to contain subsurface cultural deposits. In addition to the shovel tests, two test units were excavated. Two flakes were recovered in the shovel tests at depths between 0 and 15 cm below the surface. Two flakes and a retouched flake were recovered near the surface in Test Unit 1. Results from the subsurface excavations revealed a very sparse subsurface artifact assemblage between 0 and 27 cm below the surface, and failed to reveal a buried cultural stratum.

No diagnostic artifacts have been recovered from the site; therefore, temporal association is inconclusive.

Two days were spent at this site.
Eligibility Recommendation: The site is recommended not eligible for nomination to the NRHP because so little can be understood about it that it is not possible to determine if specific important research questions can be answered by data contained in the property. Moreover, the artifact scatter is restricted to the surface.
Management Recommendation: No further archeological work.

CHAPTER 20
CONCLUSIONS

Evaluative testing of thirteen archeological sites on the FCMR was accomplished over the period from July 13 through August 17, 1999. Five (38%) of these sites demonstrate the potential for significant buried cultural deposits, and are therefore recommended as eligible for nomination to the NRHP. It is further recommended that they all be afforded protection, probably in the form of protective fencing. In the case of 5EP1080, where several features are exposed in the road cut, it is suggested that data recovery be considered an option for this portion of the site. The remaining eight sites are not recommended as eligible for nomination to the NRHP under Criterion D, and do not require further archeological work. With the exception of a few short delays at Range Control and expected but minor weather-related time loss, the project was completed in a timely and professional manner.

The five sites recommended as eligible for nomination to the NRHP are: 5EP1080 (a Late Prehistoric open hearth site), 5EP1345 (a multicomponent Paleo/Archaic to late Prehistoric alcove and open site), 5PE750 (a Late Archaic/Late Prehistoric lithic and groundstone scatter with associated stacked-stone structures, a 5PE1610 (a Late Prehistoric rock shelter/alcove), and 5PE1807 (a Late Prehistoric alcove and open site). Four of these sites provided material suitable for radiocarbon dating. These sites, together with the other eight not recommended as eligible, comprise a wide span of FCMR prehistory and provide evidence for a notable prehistoric occupation of the area during the Developmental (AD 100–1050) and Diversification periods (AD 1050–1450) of the Late Prehistoric stage.

This report is the final document in a series that covers the results of a cooperative agreement that was initiated between FLC and MWAC in 1995 to provide archeological inventory and testing services on the FCMR. The overall project has contributed significantly to our knowledge of the prehistory and history of the FCMR and southern Colorado, and has provided cultural resource managers an understanding of the range of materials under their jurisdiction and the most appropriate ways in which to manage them. It also provided trainee student archeologists the opportunity to learn their craft in a rigorously professional and real-world environment.

CHAPTER 21
REFERENCES CITED

Adams, J. L.

1998 *Manual for a Technological Approach to Ground Stone Analysis.* Center for Desert Technology, Tucson, AZ.

Ahler, S. A.

1989 Experimental Knapping with KRF and Midcontinent Cherts: Overview and Applications. In *Experiments in Lithic Technology*, edited by D.S. Amick and Raymond P. Mauldin, pp. 199-234. BAR International Series 528, Oxford.

1997 *Field Analysis System for Surface Lithic Artifacts Encountered in the Black Hills Survey Project, Pinon Canyon Maneuver Site, Colorado*. Report submitted to the Department of Sociology and Anthropology, New Mexico State University, Las Cruces. PaleoCultural Research Group, Flagstaff, AZ.

Ahler S. A., and M. Smail

1999 *Stone Tools and Flaking Debris.* In Research Contribution No 13. of PaleoCultural Research Group, Flagstaff, Arizona.

Albanese, J. P., and M. Wilson

1974 Preliminary Description of the Terraces of the North Platte River at Casper, Wyoming. In *Applied Geology and Archaeology: The Holocene History of Wyoming*, edited by M. Wilson, pp. 8-18. Report of Investigation No. 10. Geological Survey of Wyoming.

Alexander, R., J. Hartley, and T. Babcock

1982 *A Settlement Survey of the Fort Carson Military Reservation.* 3 viols. Ms. on file, Grand River Consultants, Grand Junction, CO.

Anderson, J. L.

1990 Prehistoric overview. In *An Introduction to the Archaeology of Piñon Canyon, Southeastern Colorado*, vol. II, edited by W. Andrefsky, Jr., pp. VII-1-30. Ms. submitted to the National Park Service, Rocky Mountain Regional Office, Denver.

Antevs, E.

1955 Geologic-climatic Dating in the West. *American Antiquity* 20:317-35.

Arbogast, W. R., W. N. Gallon, A. Grundmann
1983 Colorado Cultural Resource Survey Form for 5PE1610.

Athearn, F. J.
1985 *Land of Contrast. A History of Southeast Colorado.* Cultural Resource Series 7. Bureau of Land Management, Denver.

Bamforth, D. B.
1988 *Ecology and Human Organization on the Great Plains.* Plenum Press, New York.

Barnes, A.
1991 *An Archival and Photographic Study of World War II Temporary Wooden Buildings, Fort Carson Military Reservation, Colorado.* Ms. submitted to the National Park Service, Rocky Mountain Regional Office, Denver.

Bass, W. B., and P. Kutsche
1963 A human skeleton from Pueblo County, Colorado. *Southwestern Lore* 29(2):40-43.

Baugh, T. G.
1994 Holocene adaptations in the southern High Plains. In *Plains Indians AD 500-1500*, edited by K. Schlesier, pp. 264-289. University of Oklahoma Press, Norman.

Bender, S. J., and G. A. Wright
1988 High-altitude occupations, culture process, and High Plains prehistory: retrospect and prospect. *American Anthropologist* 90:619-639.

Benedict, J. B.
1992 Footprints in the snow: high-altitude cultural ecology of the Colorado Front Range. *Arctic and Alpine Research* 24:1-16.

Benedict, J. B., and B. Olson
1978 *The Mount Albion Complex. A Study of Prehistoric Man and the Altithermal.* Research Report 1. Center for Mountain Archaeology, Ward, CO.

Black, K. D.
1991 Archaic continuity in the Colorado Rockies: The Mountain Tradition. *Plains Anthropologist* 36:1-29.

1994 *Archaeology of the Dinosaur Ridge Area.* Friends of Dinosaur Ridge and the Colorado Historical Society, Denver, CO.

Buchner, A. P.

1979 *Cultural Responses to Altithermal (Atlantic) Climate along the Eastern Margins of the North American Grasslands: 5500-3000 BC* Ph.D. dissertation, University of Calgary.

Burns, G. R., and W. K. Killam

1983 Cultural Resource Inventory of Tank Gunnery Range Fan Number 45, Fort Carson Military Reservation, Colorado. *Cultural Resource Report 5.* Ms. on file, Goodson and Associates Inc., Lakewood, CO.

Butler, W. B.

1985 *Taxonomy in Northeastern Colorado Prehistory.* Unpublished Ph.D. dissertation, University of Missouri, Columbia.

1986 *Taxonomy in Northeastern Colorado Prehistory.* Ph.D. dissertation, University of Missouri, Columbia.

1990 *Cultural Resource Survey of Ten Soil Conservation Structures and the Gale Irrigation Ditch, Fort Carson Military Reservation, El Paso and Pueblo Counties, Colorado.* Ms. submitted to Army Environment, Energy and Natural Resources Division, Fort Carson, CO.

1991 *Reconnaissance Survey of a Proposed Fiber-Optic Line, Fort Carson Military Reservation, El Paso and Pueblo Counties, Colorado.* Ms.. submitted to U.S. Army 4th Infantry Division (Mech) and HQ Fort Carson, Fort Carson, CO.

1992 *Cultural Resource Investigation of Several Small Scale Projects on the Fort Carson Military Reservation, El Paso and Pueblo Counties, Colorado.* Ms. on file, National Park Service, Interagency Archeological Services-Denver, Denver.

Butler, W. B., S. A. Chomko, and J. M. Hoffman

1986 The Red Creek Burial, El Paso County, Colorado. *Southwestern Lore* 52(2):6-27.

Butzer, K. W.

1982 *Archaeology as Human Ecology.* Cambridge University Press, Cambridge.

Calabrese, F. A.

1972 Cross Ranch: A Study of Variability in a Stable Cultural Tradition. *Plains Anthropologist, Memoir* 9.

Campbell, R. G.

1969 *Prehistoric Panhandle Culture on the Chaquaqua Plateau, Southeastern Colorado*. Ph.D. dissertation, University of Colorado.

1976 The Panhandle Aspect of the Chaquaqua Plateau. *Graduate Studies of Texas Technical University* 11, Lubbock, TX.

Carrillo, R.

1990 Historic overview. In *An Introduction to the Archaeology of Piñon Canyon, Southeastern Colorado*, vol. III, edited by W. Andrefsky, Jr., pp. XVIII-1-45. Ms. submitted to the National Park Service, Rocky Mountain Regional Office, Denver.

Cassells, E. S.

1992 A History of Colorado Archaeology: I. In *The State of Colorado Archaeology*, edited by P. Duke and G. Mattock, pp.4-34. Colorado Archaeological Society Memoir 5, Denver.

1997 *The Archaeology of Colorado*. 2nd edition. Johnson Books, Boulder, CO.

Charles, M., P. Duke, and R. Nathan

1997 *A Cultural Resource Inventory of Portions of Booth Mountain, Fort Carson Military Reservation, Pueblo County, Colorado.* Ms. submitted to the Midwest Archeological Center, Lincoln, NE.

Charles, M., R. Nathan, P. Duke, N. Salazar and S. Larmore

1999a *Results of a Cultural Resource Inventory of Portions of Fort Carson Military Reservation and Test Excavations of Site 5EP2524, El Paso County, Colorado, 1996.* Ms. submitted to the Midwest Archeological Center, Lincoln, NE.

1999b *Results of the 1997 Cultural Resource Reevaluation Project; Fort Carson military Reservation: El Paso, Fremont, and Pueblo counties, Colorado*. Ms. submitted to the Midwest Archeological Center, Lincoln, NE.

Charles, M., P. Duke, R. Nathan, S. Bryan and C. Markussen

2000 *A Cultural Resource Inventory of High- and Medium-Site Sensitivity Areas, Fort Carson Military Reservation: El Paso, Fremont, and Pueblo Counties,*

Colorado, 1998. Ms. Submitted to the Midwest Archaeological Center, Lincoln, NE.

Chomko, S. A.
1991 Wyoming and the High Plains: the levels to the truth. Paper presented at the 49th Plains Conference, Lawrence, KS.

Chomko, S. A., S. DeVore, and L. Loendorf.
1990 Apishapa Phase Research at the Piñon Canyon Maneuver Site, Southeastern Colorado. Paper presented at the 48th Plains Conference, Oklahoma City.

Chomko, S. A., and V. W. Schiavitti
2000 *A Cultural Resources Inventory of the Range 155 Upgrades and Erosion Control Structure, El Paso and Pueblo Counties, Fort Carson, Colorado.* Fort Carson Cultural Resources Management Series Contribution No. 1. Fort Carson, CO.

Connor, M., and J. Schneck
1996 *The Old Hospital Complex (5EP1778) Fort Carson, Colorado.* National Park Service, Midwest Archeological Center, Lincoln, NE.

Dean, J. C.
1992 *Guidelines to Required Procedures for Archaeological Field and Laboratory Work at Piñon Canyon Maneuver Site, Las Animas County, Colorado.* Ms. submitted to the U.S. Army by Department of Anthropology, University of North Dakota.

Department of the Army
1984 *Facilities Engineering: Historic Preservation—Army Regulation AR 420-40.* Headquarters, Department of the Army, Washington D.C.

Dick, H. W.
1963 *Preliminary Report: Trinidad Reservoir, Las Animal County, Colorado.* Ms. on file, Midwest Archeological Center, National Park Service, Lincoln, NE.

Drass, R.R.
1998 The Southern Plains Villagers. In *Archaeology of the Great Plains*, edited by W.R. Wood, pp. 415-455. University Press of Kansas, Lawrence.

Driver, J. C.

1978 *Holocene Man and Environments in the Crowsnest Pass, Alberta*. Ph.D. dissertation, University of Calgary

Duke, P.

1978 *The Crowsnest Pass: A Locational Analysis*. Master's thesis, University of Calgary.

Duke, P., and M. Wilson

1994 Cultures of the Mountains and Plains: From the Selkirk Mountains to the Bitterroot Range. In *Plains Indians AD 500–1500*, edited by K. Schlesier, pp. 56-70. University of Oklahoma Press, Norman.

1995 Introduction. Postprocessualism and plains archaeology. In *Beyond Subsistence: Plains Archaeology and the Postprocessual Critique*, edited by P. Duke and M. Wilson, pp. 1-27. University of Alabama Press, Tuscaloosa.

Eddy, F. W., P. Friedman, R. Oberlin, T. Farmer, D. Dahms, J. Reining, B. Leichtman.

1982 *The Cultural Resource Inventory of the John Martin Dam and Reservoir*. Ms. on file, Corps of Engineers, Albuquerque, NM.

Eddy, F. W., R. Oberlin, and T. R. Farmer

1984 Spatial analysis of archaeological data at the John Martin Dam and Reservoir, Southeastern Colorado. *Plains Anthropologist* 29 (103):25-40.

Eighmy, J.

1984 *Colorado Plains Prehistoric Context for Management of Prehistoric Resources of the Colorado Plains, RP3 Documents*. Office of Archaeology and Historic Preservation, Colorado Historical Society, Denver.

Evanoff, E., B. Burger, M. Burke, M. Dorsett, and K. Wright

1996 *Preliminary Mapping and Report of the Physiography, Geophysical Data, Surficial Geology, and Paleontological Resources of the Fort Carson Military Reservation, Colorado*. Ms. submitted to the Midwest Archeological Center, Lincoln, NE.

Fenneman, N.

1931 *Physiography of Western United States.* McGraw Hill, New York.

Forbes, J. D.
1960 *Apache, Navajo and Spaniard*. University of Oklahoma Press, Norman.

Frison, G. C.
1973 The Plains. In *The Development of North American Archaeology*, edited by J. Fitting, pp. 151-184. Doubleday Books, Garden City, NY.

Frison, G. C., J.E. Francis, and J.C. Miller
1991 *Prehistoric Hunters of the High Plains*. 2nd edition. Academic Press, New York.

Fulgham, T., and J. Anderson
1984 Proposed Chronological Framework for the Fort Carson-Piñon Canyon Area. Contribution No. 2. *Phase I of the Fort Carson-Piñon Canyon Project*. Ms. submitted to the National Park Service, Rocky Mountain Regional Office, Denver.

Grant, M. P., and C. Zier
1987 *An Archaeological Inventory of Selected Sample Transects on the Fort Carson Military Reservation, El Paso, Fremont, and Pueblo Counties, Colorado*. Ms. on file, Centennial Archaeology, Inc., Fort Collins, CO.

Gunnerson, J. H.
1987 *Archaeology of the High Plains*. Bureau of Land Management, Denver, CO.

1989 *Apishapa Canyon Archeology: Excavations at the Cramer, Snakes Blakeslee and Nearby Sites*. Reprints in Anthropology 41. J&L Reprint Co, Lincoln, NE.

Guthrie, M. R., P. Gadd, R. Johnson, J. J. Lischka
1984 *Colorado Mountains Prehistoric Context, RP3 Documents*. Office of Archaeology and Historic Preservation, Colorado Historical Society, Denver.

Hammond, G. P., and A. Rey (eds.)
1940 *Narratives of the Coronado Expedition, 1540-1542*. University of New Mexico Press, Albuquerque.

Hartley, J. D., C. A. Rolen, T. F. Babcock, and R. K. Alexander
1983 *A Settlement Survey of the Fort Carson Military Reservation, Vol. II: 1982*

Site Investigations. Ms. submitted to the National Park Service, Rocky Mountain Regional Office, Denver.

Hayden, B.
1982 Interaction parameters and the demise of Paleo-Indian craftsmanship. *Plains Anthropologist* 27:109-123.

Higgs, E. S., and M. R. Jarman
1975 Palaeoeconomy. In *Palaeoeconomy*, edited by E.S. Higgs, pp. 1-7. Cambridge University Press, Cambridge.

Hunt, C. B.
1954 Pleistocene and Recent Deposits in the Denver Area, Colorado. *U.S. Geological Survey Bulletin* 996-C, pp. 91-140.

Hurd, C. W.
1960 *Bent's Stockade Hidden in the Hills*. Bent County Democrat, Las Animal, CO.

Hutchinson, L. A.
1990 *Archaeological Investigations of High Altitude Sites near Monarch Pass, Colorado*. Master's thesis, Colorado State University, Fort Collins, CO.

Hyde, G.
1976 *Indians of the High Plains*. University of Oklahoma Press, Norman. First edition published, 1959.

Ireland, S. K.
1968 *Five Apishapa Focus Sites in the Arkansas Valley, Colorado*. Master's thesis, University of Denver.

Irwin H. J., and C. C. Irwin
1959 *Excavations at the LoDaiska Site in the Denver, Colorado, Area*. Denver Museum of Natural History Proceedings No. 8.

Jepson, D. A., C. J. Zier, S. M. Kalasz, and A. M. Barnes
1992 *Archaeological Survey of High Priority Parcels and Other Miscellaneous Areas on the Fort Carson Military Reservation, El Paso, Pueblo, and Fremont Counties, Colorado*. Ms. submitted to the National Park Service, Rocky Mountain Regional Office, Denver.

Johnson, E. (editor)
1988 *Lubbock Lake. Late Quaternary Studies on the Southern High Plains.* Texas A & M University Press, College Station.

Jones, D. G., M. Williams, K. Stemmler, M. H. McGrath, and E. C. Winstead
1998 *Ethnohistoric and Ethnographic Information Related to the Fort Carson Military Reservation and Piñon Canyon Maneuver Site in Colorado.* Department of the Army, St. Louis, MO.

Kalasz, S., D. Jepson, C. Zier, M. Van Ness
1993 *Test Excavations of Seven Prehistoric Sites on the Fort Carson Military Reservation, El Paso and Pueblo Counties, Colorado.* Ms. submitted to the National Park Service Rocky Mountain Regional Office, Denver.

Kelly, R. L., and L. Todd
1988 Coming into the country: early Paleoindian hunting and mobility. *American Antiquity* 53:231-244.

Kingsbury, L. A., and L. H. Gabel
1983 Eastern Apache campsites in southeastern Colorado: an hypothesis. In *From Microcosm to Macrocosm: Advances in Tipi Ring Investigation and Interpretation*, edited by L. B. Davis, pp. 319-325. *Plains Anthropologist Memoir* 19.

Korgel, R.
1996 *Test Excavations at Mountain Post Sports Complex Fort Carson, Colorado.* Ms. on file, Midwest Archeological Center, Lincoln, NE.

Krause, R.A.
1998 A History of Great Plains Prehistory. In *Archaeology of the Great Plains*, edited by W.R. Wood, pp. 48-86. University Press of Kansas, Lawrence.

Kroeber, A.
1939 *Cultural and Natural Areas of Native North America.* University of California Press, Berkeley, CA.

Kuehn, D. D.
1993 Landforms and Archaeological Site Location in the Little Missouri Badlands: A New Look at Some Well-Established Patterns. *Geoarchaeology: An International Journal* 8(4):313-332.

1998 *Results of a Reconnaissance-Level Geomorphic and Geoarchaeological Inventory of Red Creek, Fort Carson Military Reservation, Colorado*. Ms. submitted to the Midwest Archeological Center, Lincoln, NE.

Larmore, S., and R. Nathan
1999 Artifact Analysis. In *Results of the 1997 Cultural Resource Reevaluation Project; Fort Carson Military Reservation: El Paso, Fremont, and Pueblo Counties, Colorado*. By M. Charles, R. Nathan, P. Duke, N. Salazar, and S. Larmore.

Lewis, O.
1942 *The Effects of White Contact upon Blackfoot Culture, with Special Reference to the Fur Trade*. American Ethnological Society Monograph 6.

Lintz, C.
1978 Architecture and radiocarbon dating of the Antelope Creek Focus: a test of Campbell's model. *Plains Anthropologist* 23:319-328.

1984 *Architecture and Community Variability within the Antelope Creek Phase of the Texas Panhandle*. Ph.D. dissertation, University of Oklahoma.

1986 The historical development of a culture complex: the basis for understanding architectural misconceptions of the Antelope Creek Focus. In *Current Trends in Southern Plains Archaeology*, edited by T. G. Baugh, pp. 111-128. *Plains Anthropologist Memoir 21*.

Lintz, C., and J. L. Anderson (editors)
1989 *Temporal Assessment of Diagnostic Materials from the Piñon Canyon Maneuver Site*. Memoirs of the Colorado Archaeological Society 4, Denver.

Loendorf, L. L., J. L. Borchert, and D. G. Klinner
1996 *Archeological Investigations at Ceramic Stage Sites in the Pinon Canyon Maneuver Site, Colorado*. Department of Anthropology Contribution No. 308, University of North Dakota, Grand Forks.

Loendorf, L. L., and C. R. Loendorf
1999 *Archaeological Sites in Welsh Canyon, Las Animas County, Colorado*. Department of Sociology and Anthropology, New Mexico State University, Las Cruces.

Lutz, B., and W. Hunt, Jr.

1979 *Models for Patterns and Change in Prehistoric Settlement-Subsistence Systems of the Purgatoire and Apishapa Highlands*. Ms. submitted to Interagency Archaeological Service, Denver.

Madole, R. F.

1989 Geomorphology and late Quaternary stratigraphy. In *Archeological Excavation of Recon John Shelter (5PE648) on the Fort Carson Military Reservation, Pueblo County, Colorado*, edited by C. J. Zier, pp. 276-288. Ms. submitted to the National Park Service, Rocky Mountain Regional Office, Denver.

1990 Geomorphology and Late Quaternary Stratigraphy. In *Archaeological Survey and Test Excavation in the Turkey Canyon Area, Fort Carson Military Reservation, Pueblo and El Paso Counties, Colorado*, edited by M. A. Van Ness, S. M. Kalasz, C. J. Zier, D. A. Jepson, M. S. Toll, R. F. Madole, and R. F. Carrillo, pp.104-123. Ms. submitted to the National Park Service, Rocky Mountain Regional Office, Denver.

Magne, M. P. R.

1985 *Lithics and Livelihood: Stone Tool Technologies of Central and Southern Interior British Columbia*. Archaeological Survey of Canada Paper No. 133. National Museums of Canada, Ottawa.

Mattock, G., and P. Duke

1992 The state of the state: a critical review. In *The State of Colorado Archaeology*, edited by P. Duke and G. Mattock, pp.173-205. Colorado Archaeological Society Memoir 5, Denver.

McHugh T.

1958 Social behavior of the American buffalo. *Zoologica* 43:1-40.

McKern, W. C.

1939 The Midwestern Taxonomic Method as an Aid to Archaeological Study. *American Antiquity* 4:579-82.

Mehls, S. F., and C. J. Carter

1984 *Colorado Southern Frontier Historic Context, RP3 Document*. Office of Archaeology and Historic Preservation, Colorado Historical Society, Denver.

Mitchell, M.

1996 The Sopris Phase in regional perspective: an examination of prehistoric frontiers in southeast Colorado. Paper presented at the Annual Meeting of the Colorado Council of Professional Archaeologists, Anasazi Heritage Center, Dolores, CO.

Mueller, M. A.

1995 *User's Guide to the Fort Carson Site-Level Databases*. Ms. submitted to the National Park Service, Rocky Mountain Regional Office, Denver.

Mueller M. A., and S. A. McBride

1995 *Fort Carson Curation Notebook and Artifact Database Documentation*. Ms. on file, National Park Service, Rocky Mountain Regional Office, Denver.

Nickens, P. R. (ed.)

1988 Archaeology of the Eastern Ute: A Symposium. Colorado Council of Professional Archaeologists Occasional Papers 1.

Perino, G.

1971 *Guide to the Identification of Certain American Indian Projectile Points*. Special Bulletin No. 4 of the Oklahoma Anthropological Society,

Quigg, J. M.

1974 *The Belly River: Prehistoric Population Dynamics in a Northwestern Plains Transition Zone*. Mercury Series No. 23. Archaeological Survey of Canada.

Reeves, B. O. K.

1973 The concept of an Altithermal cultural hiatus in Northern Plains archaeology. *American Anthropologist* 75:1221-1253.

1981 The Rocky Mountain eastern slopes: problems and considerations. In *Alberta Archaeology: Prospect and Retrospect,* edited by T. A. Moore, pp. 31-38. Archaeological Society of Alberta, Lethbridge.

Renaud, E. B.

1930 Unpublished notes from 1930 field season, on file at Department of Anthropology, University of Denver, Denver.

1931a *Archaeological Survey of Eastern Colorado*. Department of Anthropology, University of Denver Report No. 1, Denver.

1931b *Investigation of Rockshelter in Turkey Creek District, Colorado*. Science Service Research Announcement No. 59. Science Service, Washington, D.C.

Rockafellow, B. F.
1881 *History of Fremont County: History of the Arkansas Valley - Colorado.* O. L. Baskin, Chicago.

Roe, F.
1951 *The North American Buffalo: a Critical Study of the Species in its Wild State.* University of Toronto Press, Toronto.

1955 *The Indian and the Horse*. University of Oklahoma Press, Norman.

Ronaghan, B. (editor)
1986 *Eastern Slopes Prehistory: Selected Papers*. Archaeological Survey of Alberta Occasional Paper No. 30.

Schlesier, K. H.
1972 Rethinking the Dismal River Aspect and the Plains Athapaskans, AD 1692-1768. *Plains Anthropologist* 17:101-133.

Schroeder, A. H.
1974 A study of the Apache Indians. In *American Indian Ethnohistory: Indians of the Southwest*, edited by D. A. Horr. Garland Books, New York.

Spath, C.
1993 *City of Colorado Springs, Department of Wastewater, Proposed Test Wells on Fort Carson Military Reservation, Township 16 South, Range 66 W, Section 36, El Paso County: Class III Cultural Resource Inventory*. Ms. on file, Metcalf Archaeological Consultants, Inc., Eagle, CO.

Spielmann, K.
1991 *Farmers, Hunters, and Colonists*. University of Arizona Press. Tucson, Arizona.

Strahler, A. N.
1952 Quantitative geomorphology of drainage basins and channel networks. *Handbook of Applied Hydrology*, edited by V. T. Chow, pp. McGraw-Hill, New York.

Strong, W. D.

1935 An Introduction to Nebraska Archaeology. *Smithsonian Miscellaneous Collections 100*:353-394, Washington D.C.

Sullivan, A. P., III, and K. C. Rozen

1985 Debitage analysis and archaeological interpretation. *American Antiquity* 50: 755-779.

Turner, C. G., II

1980 Appendix I: Suggestive dental evidence for Athabascan affiliation in a Colorado skeletal series. In *Trinidad Lake Cultural Resource Study, Part II: the Prehistoric Occupation of the Upper Purgatoire River Valley*, edited by C.E. Wood and G.A. Bair. Ms. on file, Interagency Archaeological Services, Denver, CO.

U. S. Department of the Interior

1995 *How to Apply the National Register Criteria for Evaluation Bulletin No. 15.* U.S. Department of the Interior National Park Service, Washington D.C.

Van Ness, M. A., S. M. Kalasz, C. J. Zier, D. A. Jepson, M. S. Toll, R. F. Madole, and R. F. Carrillo

1990 *Archaeological Survey and Test Excavation in the Turkey Canyon Area, Fort Carson Military Reservation, Pueblo and El Paso Counties, Colorado*. Ms. on file, the National Park Service, Rocky Mountain Regional Office, Denver.

Vickers, J. R.

1994 Cultures of the Northwestern Plains: From the Boreal Forest Edge to Milk River. In *Plains Indians AD 500–1500*, edited K. Schlesier, pp. 3-33. University of Oklahoma Press, Norman.

Wallace, E., and A. Hoebel

1952 *The Comanches.* University of Oklahoma Press, Norman.

Watts, H. K.

1971 *The Archaeology of the Avery Ranch Site on Turkey Creek, Southeastern Colorado*. Master's thesis, University of Denver.

1975 The Avery Ranch site. *Southwestern Lore* 41:15-27.

Weber, K. R.

1990 Ethnohistory of the Piñon Canyon Maneuver Site. In *An Introduction to the Archaeology of Piñon Canyon, Southeastern Colorado, Vol. III*, edited by W. Andrefsky, Jr., pp. XVII-1-28. Ms. submitted to the National Park Service, Rocky Mountain Regional Office, Denver.

Wedel, W.

1936 *An Introduction to Pawnee Archaeology*. Bureau of American Ethnology Bulletin No. 112, Washington D.C.

1983 Changing perspectives in Plains Archaeology. *Plains Anthropologist* 28: 89-97.

Weimer, M.

1995 Predictive modeling and cultural resource management: an alternative view from the Plains periphery. In *Beyond Subsistence: Plains Archaeology and the Postprocessual Critique*, edited by P. Duke and M. Wilson, pp. 90-109. University of Alabama Press, Tuscaloosa.

Wendland, W. M.

1978 Holocene man in North America: the ecological setting and climatic background. *Plains Anthropologist* 23:273-287.

Wendland, W. M., and R. Bryson.

1974 Dating climatic episodes of the Holocene. *Quaternary Research* 4:9-24.

Wheat, J. B.

1972 *The Olsen-Chubbuck Site: A Paleo-Indian Bison Kill*. Society for American Archaeology Memoir 26, Washington D.C.

Willey, G. R., and P. Phillips

1958 *Method and Theory in American Archaeology*. University of Chicago Press, Chicago.

Wilson, M. C.

1988 Bison dentitions from the Henry Smith site, Montana: evidence for seasonality and paleoenvironments at an Avonlea bison kill. In *Avonlea Yesterday and Today: Archaeology and Prehistory*, edited by L. Davis, pp. 203-225. Saskatchewan Archaeological Society, Saskatoon, Saskatchewan.

Withers, A. M.

1954 Reports of Archaeological Fieldwork in Colorado, Wyoming, New Mexico, Arizona, and Utah in 1952 and 1953—University of Denver Archaeological Fieldwork. *Southwestern Lore* 19:1-3.

1964 *An Archaeological Survey of Northwestern Pueblo County, Colorado*. Ms. on file, Department of Anthropology, University of Denver.

Wood, C. E., and G. A. Bair

1980 *Trinidad lake Cultural Resource Study, Part II: The Prehistoric Occupation of the Upper Purgatoire River Valley, Southeastern Colorado*. Ms. on file, Interagency Archaeological Services, Denver, CO.

Wood-Simpson, C.

1976 *Trinchera Cave: A Rockshelter in Southeastern Colorado*. Master's thesis, University of Wyoming.

Zier, C. J.

1984 *An Archaeological Inventory of the Red Creek Parcel on the Fort Carson Military Reservation, Colorado*. Ms. submitted to the National Park Service, Rocky Mountain Regional Office, Denver.

Zier, C. J. (editor)

1989 *Archeological Excavation of Recon John Shelter (5PE648) on the Fort Carson Military Reservation, Pueblo County, Colorado*. Ms. submitted to the National Park Service, Rocky Mountain Regional Office, Denver.

Zier, C. J., and S. M. Kalasz

1985 *Archaeological Survey and Test Excavations in the Multi-Purpose Range Complex Area, Fort Carson Military Reservation, Colorado*. Ms. submitted to the National Park Service, Rocky Mountain Regional Office, Denver.

1991 Recon John Shelter and the Archaic-Woodland transition in southeastern Colorado. *Plains Anthropologist* 135:111-138.

1999 *Colorado Prehistory; A Context for the Arkansas River Basin*. Colorado Council of Professional Archaeologists.

Zier, C. J., S. M. Kalasz, D. A. Jepson, S. A. Brown, M. W. Painter, and K. Puseman

1996 *Archaeological Survey, Site Documentation, and Test Excavations Conducted During the 1991 and 1993 Field Seasons on the Fort Carson Military*

Reservation, El Paso, Pueblo, and Fremont Counties, CO. Ms. submitted to the National Park Service, Rocky Mountain Regional Office, Denver.

Zier, C. J., J. H. Altschul, M.K. Kelly, M. R. Rose, K. P. Schweigert, and K. R. Weber
1987 *Historic Preservation Plan for Fort Carson Military Reservation, Colorado.* Ms. on file, the National Park Service, Rocky Mountain Regional Office, Denver.

Zier, C. J., S. M. Kalasz, A. H. Peebles, M. A. Van Ness, and E. Anderson
1988 *Archaeological excavation of the Avery Ranch Site (5PE56) on the Fort Carson Military Reservation, Pueblo County, Colorado.* Ms. on file, the National Park Service, Rocky Mountain Regional Office, Denver.

Zier, C. J., S. M. Kalasz, M. A. Van Ness, A. H. Peebles, and E. Anderson
1990 The Avery Ranch site revisited. *Plains Anthropologist* 128:147-173.

Zier, C. J., K. P. Schweigert, M. W. Painter, M. A. Mueller, and K. R. Weber
1997 *Cultural Resource Management Plan for Fort Carson Military Reservation, Colorado. Viols. I and II.* Ms. on file, the National Park Service, Rocky Mountain System Support Office, Denver.

APPENDIX I

AN INVENTORY AND ANALYSIS OF CERAMICS FROM THE FORT CARSON MILITARY BASE

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AN INVENTORY AND ANALYSIS OF CERAMICS FROM SITES ON THE FORT CARSON MILITARY BASE

INTRODUCTION

Hand-made pottery vessels are containers that partially enclose space with baked clay. Herein lies the key to their geometry. Most vessels are radially symmetrical. Most also have top-to-bottom asymmetry. Thus they are relatively easily divided into systematically related parts. Imagine a simple idealized pot. By simple I mean a single orifice form without appendages. By idealized I mean imaginary. Now mentally examine its topological properties. Pay special attention to the number of sides and edges. A simple idealized pot will always have two sides (the inside and the outside) and one edge (the lip). This will be the case despite the highly variable appearance that bending, stretching, twisting or appending might produce. Since the lip of this imaginary vessel is circular, all points along it, and all points systematically related to it, will be topological invariants. We may therefore use the lip as a reference for dividing the rest of the container into parts.

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Figure 1. Morphological Landmarks.

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All non-lip portions of a vessel may be identified as its body. We may then identify the maximum circumference of the body as its shoulder (Figure 1a-d), the minimum circumference of the body (which will be a point) as its bottom (Figure 1 a-f). Portions adjacent to the bottom may be identified as belonging to the vessel's base (Figure 1a-f). All portions below the shoulder may be termed the lower body (Figure 1a-d), and all portions above the shoulder, the upper body (Figure 1a-d). The minimal circumference of the upper body may be identified as the pot's mouth (Figure 1a and b). If the mouth and lip are not the same, we may identify the portion between the lip and mouth as the rim (Figure 1a and b). Shoulder-less forms (Figure 1e and f) may be accounted for by stipulating that, if the vessel has no shoulder, its mouth will be defined as the circumference nearest the lip and its bottom the circumference farthest from the lip (for definitions of the above introduced morphological landmarks see Figure 2).

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Figure 2. Primitives and Defined Terms for the Study of Ceramic Morphology

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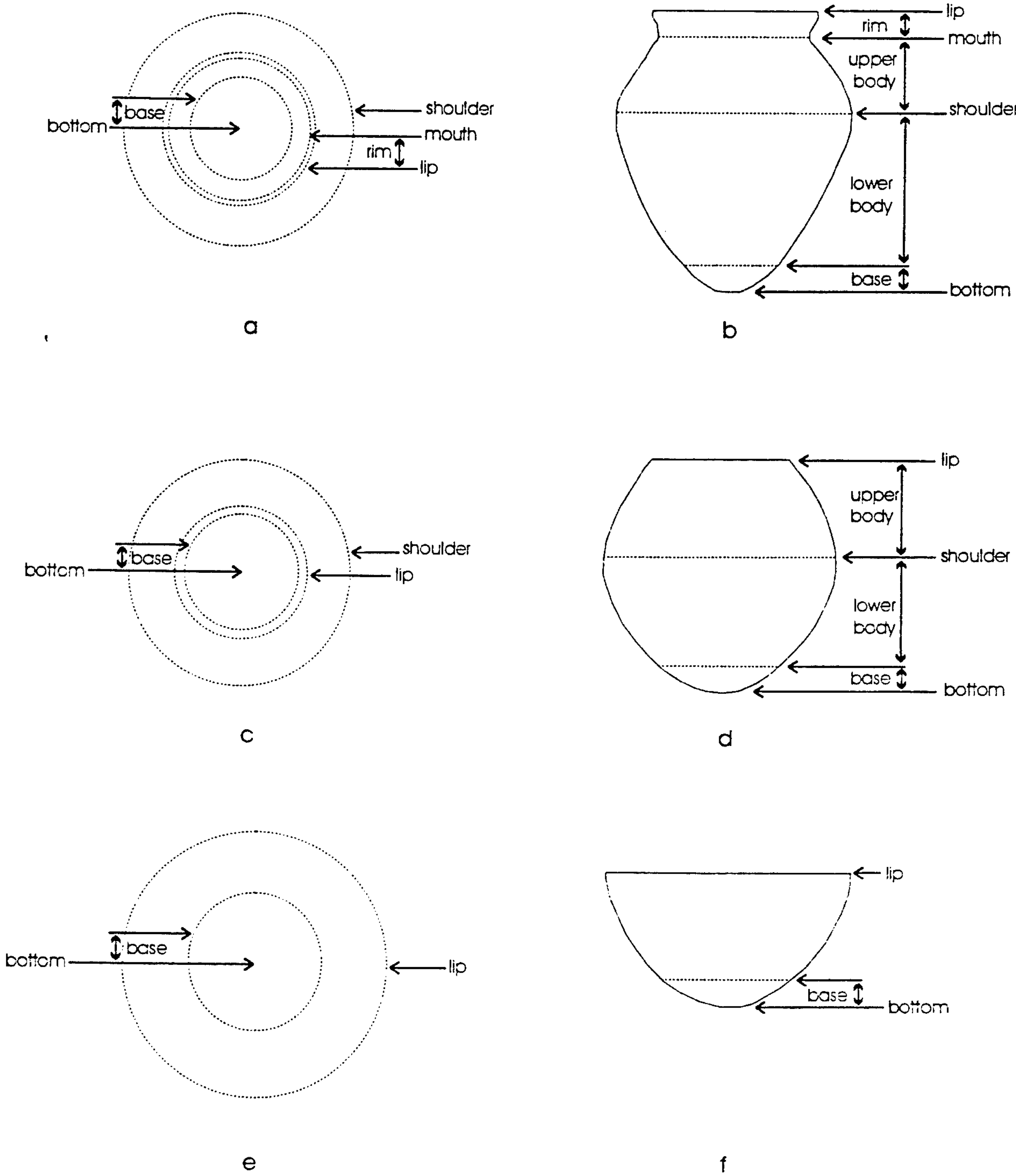

Figure 1. Morphological Landmarks

FIGURE 2: PRIMITIVES AND DEFINED TERMS FOR THE STUDY OF CERAMIC MORPHOLOGY

PRIMITIVES

Pottery (P)	Any intentionally manufactured and fired object made of clay.
Vessel (V)	Any concave utensil designed to hold a dispersible substance.
Surface (S)	Any two dimensional locus of points.
Circumference (C)	The distance around any geometric figure.

DEFINED TERMS

My definitions will consist of terms, symbols, strings and rules. The terms are lexemes that reference classes; the symbols (A, B, etc.,) are signs that stand for terms; and the strings are concatenated symbols (symbols or strings enclosed in parentheses indicate discrete sets; set complements are indicated by an exclamation point). A rule is an instruction to rewrite one symbol or string (or two strings) as another symbol or string. Arrows (--->) will be used to signal this operation. It should be noted that pottery (P) and vessel (V) are simple property terms. Surface (S) and circumference (C) have a relational syntactic weighing and as such are subject to at least two values—greater than (+) and less than (-). Brackets ([ ]) enclose operations that are to be performed before the product can be entered into a longer concatenation. Terms listed within brackets identify mutually exclusive entities.

1. *Exterior* (Ex)	Exterior is by definition that surface of a pottery vessel that is proportionally the greatest. [(P)(V)(S+)] → (Ex)
2. *Interior* (In)	Interior is by definition that surface of a pottery vessel that is proportionally the smallest. [(P)(V)(S-)] → (In)
3. *Lip* (L)	Lip is by definition the intersection of exterior and interior surfaces. [(Ex)(In)] → (L)
4. *Body* (Bd)	Body is by definition that part of a pottery vessel that does not include the lip. [(P)(V)(L!)] → (Bd)
5. *Shoulder* (Sh)	Shoulder is by definition the maximal circumference of the body. [(Bd)(C+)] → (Sh)
6. *Bottom* (Bt)	Bottom is by definition the minimal circumference of the body. [(Bd)(C-)] → (Bt)

7. ***Upper*** (Ur)	Upper is by definition the part of a body uniting shoulder with lip. [(Sh)U(L)] - (Ur)
8. ***Lower*** (Lr)	Lower is by definition the part of a body uniting shoulder with bottom. [(Sh)U(Bt)] - (Lr)
9. ***Mouth*** (M)	Mouth is by definition the minimal circumference of the upper body. [(Ur)(C-)] - (M)
10. ***Rim*** (Rm)	Rim is by definition the part of an upper body uniting mouth with lip. [(M)U(L)] - (Rm)

In sum, one may easily and consistently divide idealized pots into segments. Then too, since most vessels approximate our ideal form, departures from it, additions to it, or transformations of it, may be treated as special cases. Differently put, we may consider the ideal form as of primary morphological import. The expanded, contracted, or otherwise modified portions of the ideal form are important but not primary morphological elaborations. Thus, we may treat handles, spouts, lugs, legs, annular bases, and feet; effigies that depict animals, gods, humans, or plants; vases and flowerpots; wine, oil and water bottles; and so on, as special cases, namely as addenda to a more fundamental morphological theme.

PRODUCTION STEPS AND STAGES

Baked clay containers, of all shapes and sizes, require a multi-stage, multi-step, construction effort. A general production sequence will run as follows: (1) obtain clay, (2) prepare clay, (3) build the vessel, (4) decorate the vessel, (5) dry the vessel, and (6) fire the vessel. We may, nonetheless, expect variations in the order of vessel part fabrication and in the results obtained from different production techniques. If, for instance, we use the way the performance of a specific act affects others in the production sequence, then not all acts need be considered equal. Some will be non-commutative, for they must occur in a fixed order if a reasonably uniform result is to be achieved. These are listed above and numbered (1) through (6). Others, however, may be commutative in the sense that the order of their occurrence may vary but not markedly affect the end product. Production stage (3) i.e., build the vessel, is a case in point. Production stage (3) may be easily and consistently subdivided as follows: (A) build the bottom; (B) build the lower vessel walls; (C) build the shoulder, [if the vessel is shouldered]; (D) build the upper vessel walls; (E) build the rim [if the mouth and lip are separate orifices]; and (F) build the lip. The potter might indeed start at the bottom then build the lower body, shoulder, upper body, rim and lip in that order. Yet the potter could start at the shoulder, build the upper body, the lip, the lower body, and then the bottom. He or she could also start at the shoulder, build the lower body, the upper body, the rim, and finally the lip. Then again the potter might begin vessel formation near the lip, build the upper body, the shoulder, the lower body and bottom, then finish by forming the lip. In short, the fabrication of vessel parts may be, and often is, commutative, making the order to performance an important aspect of a given tradition of potting.

Then again, some potting acts may be optional. Optional acts are those that, at the discretion of the potter, may be deleted. Production stage (4), decorate the vessel, is frequently optional. Yet other acts may admit of alternatives. Alternatives are those acts that may be rendered with different tools or hand movements at

different times. Production stage (4), decorate the vessel, is frequently optional; but if the option to decorate is chosen, the steps within it are quite often the subject of alternative means to virtually identical or at least concordant ends. Similar decorations may, for instance, be rendered by incising, trailing, punctating or impressing, depending on the kind of tool used. Since the general stages in pottery production and decoration can be systematically detailed and when necessary can be meaningfully sub-divided we shall use a production stage format and the subdivisions introduced above in an attempt to create a ceramic data-base for the materials from Fort Carson, Colorado. But first let us make a few observations about the broader contours to prehistoric potting practices elsewhere in North America.

Raw Material Acquisition

'No matter when, where, or how pottery was made the first task was to find and collect suitable clay. Pots may be made from either primary or secondary clays. Igneous granites, decomposed by hot gasses into softer feldspar-containing rocks, provide the parent materials for both. Decomposition of feldspar-containing rocks by sun, rain, wind, and/or ice produces primary clays, all of them found where they were formed. Thus primaries tend to be light colored, usually white gray or light pink, restricted in distribution, large in particle size, relatively aplastic (with the exception of bentonite), and high firing (1200 degrees centigrade or higher). When properly treated, primary clays, insofar as they are refractory or vitrifiable, may be used to produce light-colored earthenwares, stonewares, chinas or porcelains (Casson 1979:5-6). Nevertheless, the ethnographic observations and archeological specimens available for most of North America indicate the widespread, if not universal, use of secondary rather than primary clays.

The ultimate sources of secondary clays are primary clay beds. When primary clays are moved from this source by wind, water, or ice they pick up inorganic (iron and other minerals) and organic impurities and are modified in texture and particle size. Hence secondary clays are both more widely distributed than primaries and tend to be shades of gray, brown, or red as a consequence of the impurities they contain. They are also smaller in particle size, have greater plasticity, and are more fusible, i.e., lower firing (600 to 1200 degrees centigrade) than primaries. Most fusible secondary clays will melt at firing temperatures much higher than 1300 degrees centigrade, and hence are most suitable for the production of low-fired and porous earthenwares (Casson 1979:5-6). Fired in oxygen-rich environments, secondary clays produce porous red, gray, tan, or buff wares. Fired in oxygen-poor (i.e., reducing) surroundings, they yield earthenwares in black or shades thereof. By far the greater number of North America's native potters (both those of ethnographic and

archeological record) used secondary clays dug most frequently from alluvial deposits (river, creek, and/or pond banks and/or beds), most of relatively recent geological origin.

Clay Preparation

Once clay was collected and removed to the place of manufacture, it was processed and prepared. During processing the potter removed extraneous organic or inorganic matter; crushed, dried, sifted, and/or winnowed the raw clay; and then added water, after which the clay was either set aside to age (i.e., sour) or was immediately kneaded or wedged, with or without the addition of a tempering agent. Some clays required a tempering agent (an aplastic substance added to the clay body) that allowed it to expand or contract, thus preventing cracking during drying and spalling during firing. Sand (either purposefully added or intentionally included during clay selection), ground-up pottery fragments (i.e., grog), ground-up stone of various kinds (i.e., grit), ground-up shell, and plant fibers are the most commonly reported clay body inclusions in wares from North America.

VESSEL BUILDING

Techniques of Manufacture

After proper preparation and processing, the clay may be formed into a vessel. If the vessel was to be hand-built, as were all wares in prehistoric North America, the potter had three basic techniques at his or her disposal, namely modeling, coiling, or molding. If the vessel was modeled it was pulled, pinched, punched, pounded and scraped into the desired shape and size from a lump of prepared clay, which itself was of a size that would supply most, if not all, of the raw material. The earliest ceramics in the Southeastern U.S. were mass modeled (Sassaman 1992:66-69), as were the greater number of prehistoric wares produced in the Central and Northern Plains (Wedel 1959:542-600; Lehmer 1971:22). If the vessel was to be coiled, the prepared clay mass was divided into segments each of which was subsequently rolled into coils. These coils were then either laid one upon another (i.e. stacked), or were spiraled and offset (upper either slightly inside or outside lower), or were flattened and overlapped (upper either slightly inside or outside lower). The coils were then pinched, pulled, paddled, and scraped to form a pot of the desired size and shape. Coiling was the predominate technique of vessel formation in the late Gulf formational and post Gulf formational Southeast (Jenkins and Krause 1986:48-102). It was also the predominant prehistoric building technique in the Northeastern (Funk 1978:335-62), Midwestern (Griffin 1978:256-95), and Southwestern U.S. (Rouse 1962:24-47). If

the vessel was to be molded, then prepared clay was spread over or within a wooden, stone, or ceramic, vertical or horizontal partial- or-half-mold, the pieces thus formed ultimately being joined together or joined to coiled or mass modeled sections to finish the job. Molded bases have, for example, been reported for Mississippian Stage pottery from the Southeastern U.S. (van der Leeuw 1982, personal communication). These three basic vessel-building techniques were not, of course, mutually exclusive. Each may have been combined with others to manufacture separate parts of the same pot, but one of them was usually primary in the sense that it was used to build the greater part of the vessel. 'Patch modeling' may be considered a form of coiling. In fact, rolls, pinches, or patches of clay may be added during molding, modeling, or coiling. These additions, insofar as they are *ad hoc* or are a part of rim and lip formation, do not change the basic characteristics of the three major body-forming techniques.

The Order to Vessel Part Fabrication

Beginning at the Lip

When mass modeling or coiling a vessel, the artisan may begin by forming the base, the shoulder or the area near the lip. With shouldered vessels it would have been difficult (but not impossible) for the potter to start near or at the lip when mass modeling. The major difficulty would come during shoulder manufacture when the weight of the clay between lip or near lip and shoulder rested on the near lip, and the circumference of the shoulder exceeded the circumference of the near lip. While experiments in mass modeling indicate that building from the lip down is feasible, both the shoulders and bases of such vessels are markedly thinner than lips and rims. Beginning near or at the lip is easier to accomplish if the potter is coiling. Both shouldered and shoulder-less forms may be constructed in this manner. If the potter begins coiling at or near the lip, those portions of the pot are significantly thicker than the portions near the bottom. In such cases, the lower vessel walls are thinner than their near lip counterparts, and the base (which is usually formed from a pancake-like pad laid on and over the body coil most distant from the lip) is typically thinner than the lower portion of the vessel to which it is attached. Coiling from the near lip to the base has been inferred for archeological specimens from Puerto Rico (Krause 1994:121-123) but to the best of my knowledge has not been reported ethnographically nor inferred archeologically for North American specimens.

Beginning at the Shoulder

If the artisan begins modeling at the shoulder, the clay mass is rolled into a

solid cylinder, then mashed into a flat rectangular strap whose free ends are mated and welded together to product a hollow cylinder 'starter strap' from which both the top and base are pulled. If the potter begins mass modeling at the shoulder, then the shoulder is usually significantly thicker than the near lip portions of the upper body or than the base (Krause 1984:630-31). While this is a common form of vessel building in southern Africa (Krause 1997:119), I know of no ethnographic or archeological accounts of its use north of the Rio Grande.

If the artisan begins coiling at the shoulder, then proceeds to coil the upper body and lip, the coils are usually reduced in length and diameter as the lip is approached. The lip itself is then constructed of a separate coil of clay and allowed to dry before the vessel is turned over and the lower body and base are constructed. Thus, unless they are vigorously scraped and compacted, the shoulder should be slightly thicker than the upper body. If, however, the vessel is to have a rim, it is usually built of coils or straps of clay, with a separate coil of clay providing the material for lip manufacture. If the lower body and base are coiled, the coils should diminish in both length and diameter from near shoulder to bottom, although the bottom itself may be constructed of either a pancake of mass-modeled clay (if flat) or a pinch-shaped and smoothed slab of clay (if concavo-convex). In either case, the lower body, base, and bottom should be slightly thinner than the shoulder.

Beginning at the Bottom

If the artisan begins at the bottom, then he or she either excavates a clay mass and models it, or coils or molds a base. If the potter excavates a clay mass and then models it to form the bottom, we may expect a base that is thicker than the vessel walls in general and significantly thicker than the shoulder and upper body in particular. An excavated base is less uniform than one that is coiled or molded and will not show the attachment seam of the latter two. If coiled, a long cylinder wound about itself on the flat or spiraled slightly upward and outward formed the base. Such bases, if examined under proper light and magnification, exhibit an ammonite- or nautilus-like spiral. A coiled base will be unlikely if the vessel body is mass modeled. A molded base will be less likely if the vessel body is previously or subsequently mass modeled rather than previously or subsequently coiled (Krause 1997:119).

When building from the bottom up, the lower body, shoulder (if shouldered), and upper body may be either coiled or mass modeled. If coiled, the coils should be progressively longer and of roughly the same diameter or very slightly thinner as the potter proceeds from lower body to shoulder and progressively shorter and slightly thinner as he or she proceeds from shoulder to upper body. Rim (if a rim is present)

and lip construction will most probably be accomplished as described above. If mass modeled and built from the bottom up, the lower body walls should be slightly thicker than the shoulder and the upper body walls significantly thinner than lower body walls. Again rim (if present) and lip construction will most probably be accomplished as described above.

VESSEL PART MORPHOLOGY

Base Shape

The previously discussed techniques of vessel fabrication were, of course, used at different times and in different places to produce pots of various sizes and shapes. To properly assess this variability we must further divide our units of description. All three production techniques (coiling, molding, and modeling) may be used to produce bases that are convex (Figure 3a and b), concave (Figure 3d), or flat (Figure 3c). Then too, four customary interpretations may be given to convex bases, namely round (Figure 3a), ellipsoidal, pointed (Figure 3b), and conoidal.

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Figure 3. Base Shapes. a = Round; b = Conical; c = Flat; d = Concave

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Shoulder Shape

We must also distinguish between shouldered and shoulder-less vessels. Remember that we have described the shoulder as the maximum circumference of the body. If we visualize the body as that part of a vessel between the mouth and bottom, then shoulder-less forms achieve their maximum diameter at the mouth, at the base, or in the case of cylindrical pots at both, but not in-between. Shouldered forms (vessels whose maximum body circumference lies between mouth and base) may be divided into pots whose maximum circumference lies midway between mouth and base (Figure 4a) and those that do not. With respect to the latter we may describe vessels whose maximum circumference lies above the mouth/base midpoint as high-shouldered (Figure 4b) and those whose maximum circumference lies below it as low-shouldered (Figure 4c). For want of a better expression we shall use mid-shouldered to designate vessels whose maximum circumference lies at or near the midpoint between base and mouth.

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Figure 4. Shoulder Shapes and Positions I. a-Rounded, Mid-Shouldered with Sub-Conodial Base; b-Rounded, High-Shouldered with Conodial Base; c-Rounded, Low-Shouldered with Rounded Base

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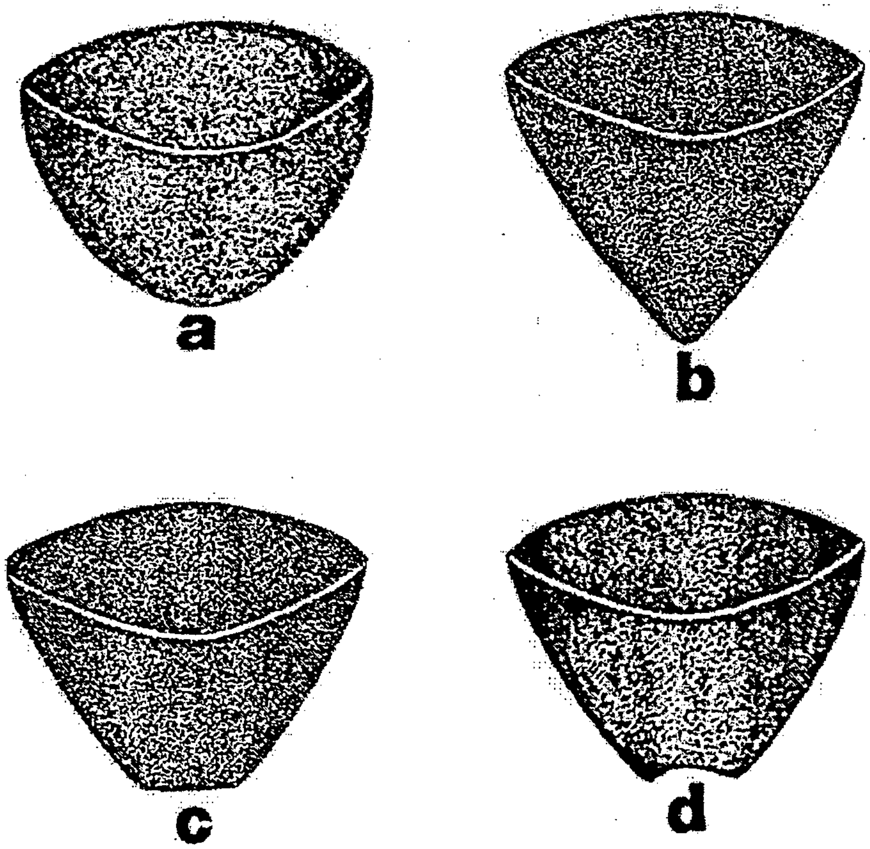

Figure 3. Base Shapes.
a -Round; b -Conical; c -Flat; d -Concave

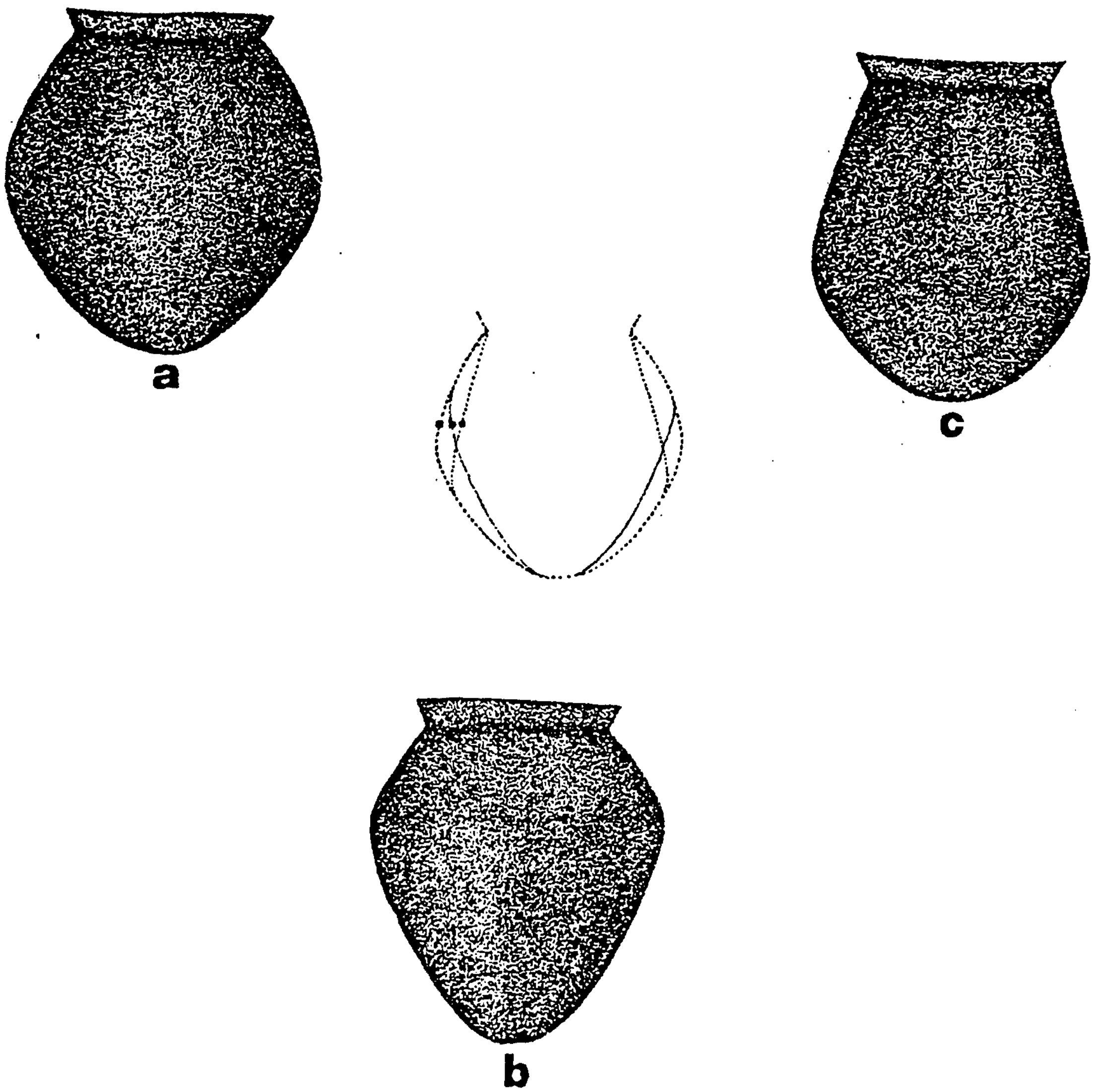

Figure 4. Shoulder Shapes and Positions I
a -Rounded, Mid-Shouldered with Sub-Conoidal Base
b -Rounded, High-Shouldered with Conodial Base
c -Rounded, Low-Shouldered with Rounded Base

Non-shouldered vessels may have curved or straight walls. Those with curved walls assume the form of hemispherical or sub-hemispherical bowls (Figure 1e and f). Those with straight walls may be cylindrical (Figure 5b) or may expand or contract from base to mouth. In the former the walls may be termed out-sloping (Figure 5a and c), in the latter, in-sloping.

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Figure 5. Non-Shouldered Vessel Forms. a-Large, Flat Base with Straight, Out-Sloping Walls; b-Flat Base with Straight Walls; c-Small, Flat Base with Out-Sloping Walls

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Shouldered vessels, whether high-, mid-, or low-shouldered may be rounded (Figure 4a-c) or angular (Figure 6a-c), with the former usually predominating in North American ceramic inventories.

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Figure 6. Shoulder Shapes and Positions II. a-Angular, Mid-Shouldered with Flat Base; b-Angular, High-Shouldered with Flat Base; c-Angular Low-Shouldered with Flat Base

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Rim Form

When the artisan reached the desired minimal circumference of the upper body, he or she could form a lip or continue to build and in so doing form a rim. Thus on rimless vessels the mouth and lip are coterminous. They are separate orifices in vessels with rims. In addition to the issue of rim vs. rimless there is also the distinction of high vs. low rim. We shall reserve the expression high rim for those that are as tall as, or taller than, one-half the distance between mouth and shoulder. By low rim we shall mean those that are shorter than one-half the distance between mouth and shoulder. Then too, both high and low rims may rise directly from the mouth, slope outward or slope inward from the mouth. Rims with virtually identical lip and mouth circumferences are customarily called straight or direct, those with greater lip than mouth circumference are described as out-flaring rims, and those with greater mouth than lip circumference are termed in-flaring rims. Thus, when the artisan reached the desired minimal circumference of the upper body, he or she could: (a) stop (Figure 1, Second and Third Rows c-f), (b) build straight upward (Figure 7e and f), (c) build upward and outward, i.e., out-flare (Figure 1, Top Row a and b) (d) build upward and outward, then brace, i.e., add a fillet of clay to the rim's outer and upper edge (Figure 7c and d) (e) build upward then brace the upper and outer edge (Figure 7c and d), (f) build upward and inward, i.e., in-flare, (g) build upward and

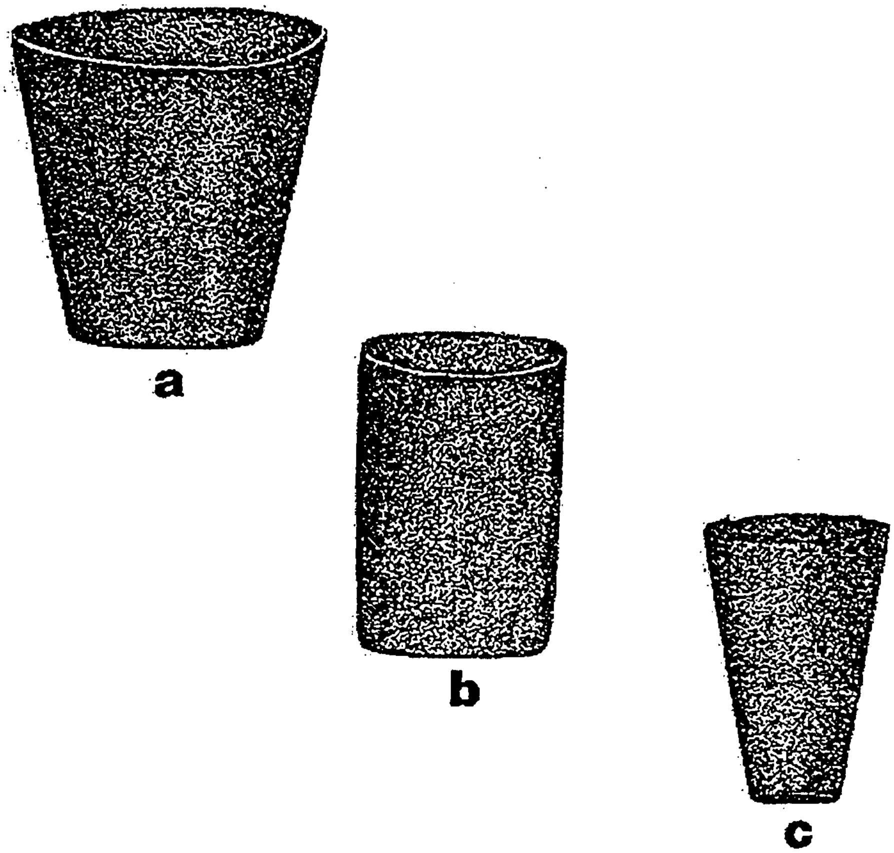

Figure 5. Non-Shouldered Vessel Forms.
a -Large Flat Base with Straight Out-Sloping Walls;
b -Flat Base with Straight Walls;
c -Small Flat Base with Straight Out-Sloping Walls

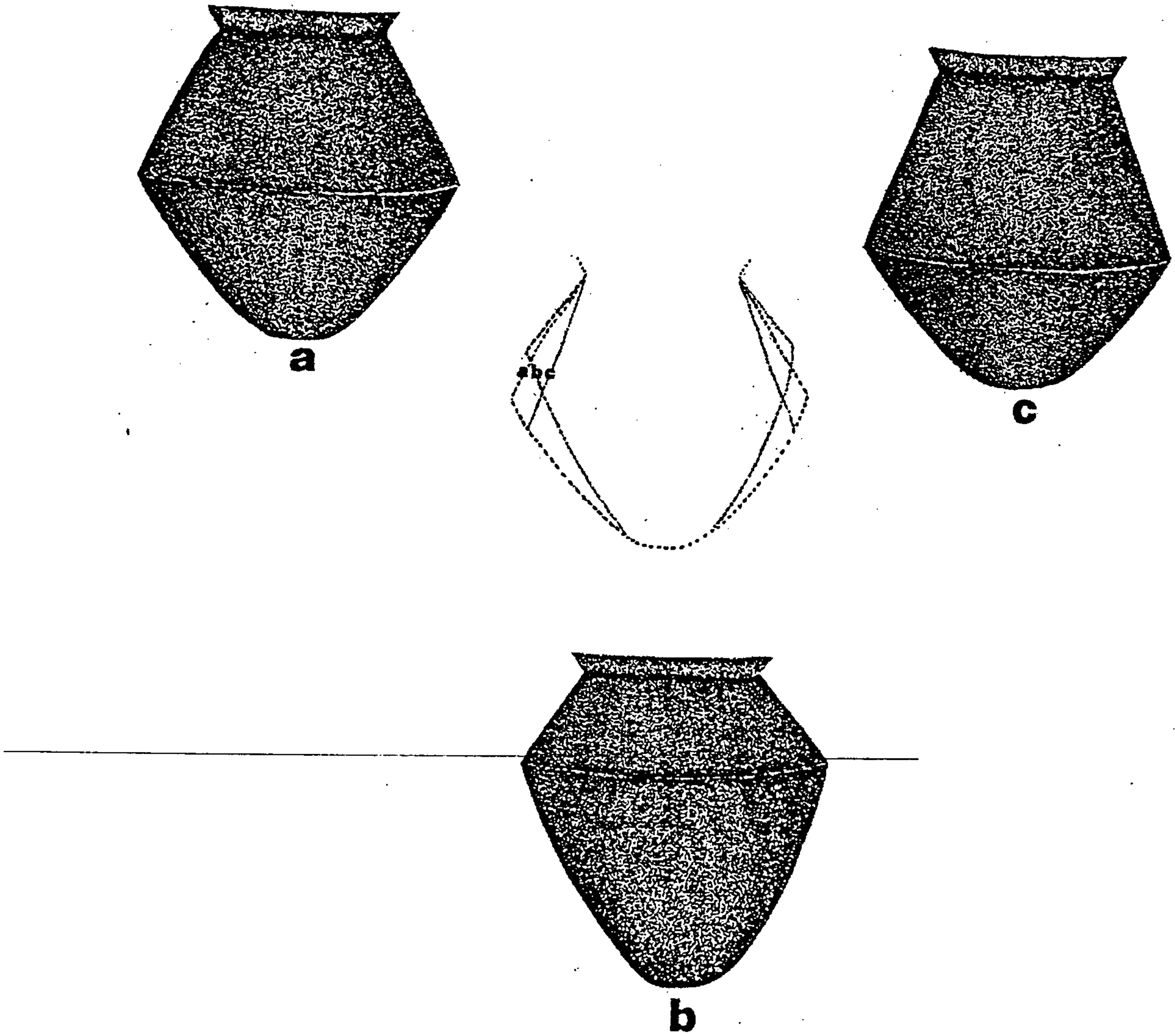

Figure 6. Shoulder Shapes and Positions II.
a -Angular, Mid-Shouldered with Flat Base
b -Angular, High-Shouldered with Flat Base
c -Angular, Low-Shouldered with Flat Base

inward then brace the upper and outer edge, (h) build upward and then outward and back again to form an S-shape (Figure 7b) or (i) build upward, outward, then upward to form a collar (Figure 7a). Each of these practices, with the exception of (a) [because it produces a rimless vessel] may be achieved in several different ways. Each rim type may be formed by pulling, thinning, and scraping the clay used in upper body formation. This procedure is, however, time-consuming, tedious, and produces a thin and, in its green ware state, often-brittle rim—especially in those cases in which the rim is high, is collared or is S-shaped.

All rim forms may also be built by adding a roll or strap of clay to the upper and outer surface of the mouth, then manipulating, scraping, and thinning it to the desired shape. The designation 'un-thickened' has been used for this single roll or single strap approach to rim manufacture. While S-shaped and collared rims may also be made from a single roll or strap, they are most easily fashioned by using two rolls or two straps, the first welded to the upper and outer surface of the mouth, the second to the upper and outer surface of the first. This two rolls or two-strap approach to collared or S-shaped rim manufacture has been described as producing thickened rims. Thus rims may be un-thickened or thickened, out-flared, straight, in-flared, braced, collared, or S-shaped. All have been described or illustrated in the North American ethnographic or archeological literature.

Figure 7 Rim and Lip Forms. a-Collared with Round Lip; b-S-Shaped with In-Beveled lip; c-Braced with Round Lip; d-Braced with Flat Lip; e-Direct with Round Lip; f-Direct with Flat Lip; g-Direct with T-Shaped Lip; h-Direct with L-Shaped Lip.

Lip Form

The lip may also be a highly variable part of a vessel on both rim bearing and rimless forms. The lip itself may be flattened (Figure 7d and f), rounded (Figure7a, b and e), beveled to the inside, beveled to the outside, beveled to both inside and outside (i.e., tapered or Δ-shaped) (Figure 7c), inverted L-shaped (Figure 7h), or T-shaped (Figure 7g). All have been reported for ceramic samples from North America. Most of the variability noted in the North American literature has, however, been produced by manipulating a lip coil that has been laid over and joined to the upper edge of the rim or, if the vessel is rimless, to the upper edge of the upper body. The appearance of even greater variability is introduced by varying the diameter of the lip coil and/or forcing the upper vessel wall or upper rim outward to evert the lip or inward to invert it.

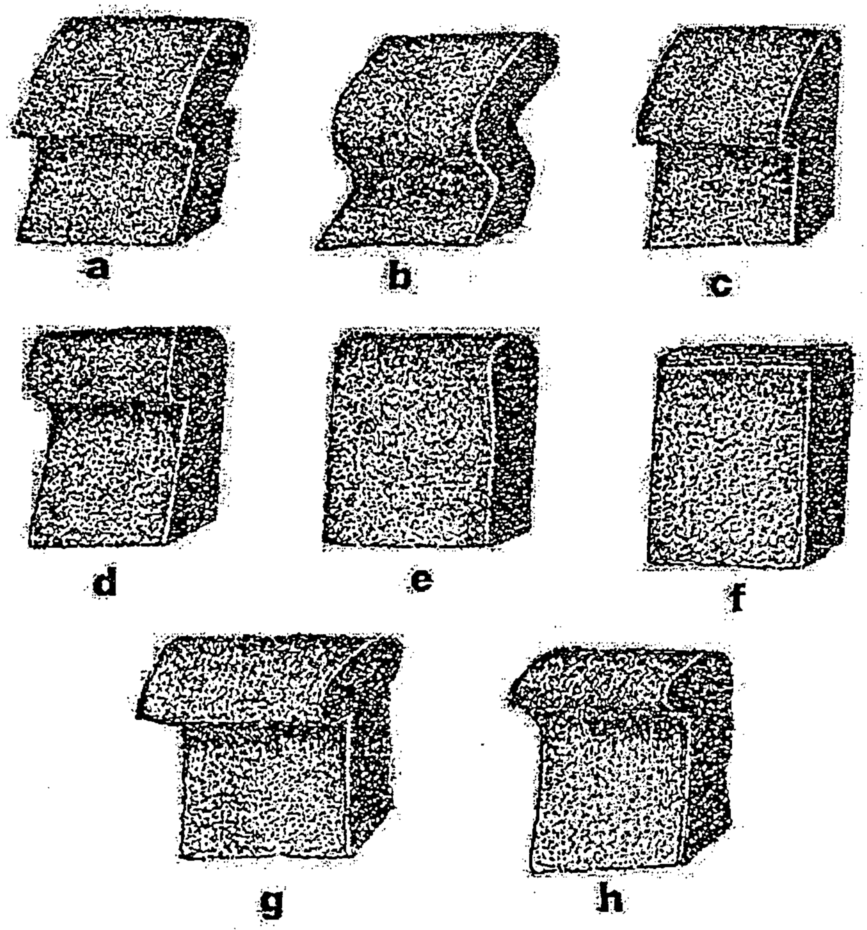

Figure 7. Rim and Lip Forms. a -Collared with Round Lip; b -S-Shaped with In-Beveled Lip; c -Braced with Round Lip; d -Braced with Flat Lip; e -Direct with Round Lip; f -Direct with Flat Lip; g -Direct with T-Shaped Lip; h -Direct with L-Shaped Lip

Appendages

Appendages added to North American ceramics include: (1) spouts (springing from the shoulder or affixed to a drastically narrowed mouth), (2) loop and strap handles (usually joining lip and shoulder), (3) lugs (both tab-shaped and oval, perforated or unperforated), affixed to the shoulder or lip, and (4) annular pedestals, podal supports or cone-shaped legs (appended to vessel bases).

DECORATION

Decorative Elements (See Figure 10 for definition)

In a general sense all vessel decorations may be easily and systematically divided into (1) those that require a substance addition, such as painting, slipping, or filleting (Figure 8f), (2) those that require the use of a tool, such as incising (Figure 8a and b), trailing (Figure 9e), punctating (Figure 9c and d), impressing (Figure 9a and b), etc., (3) those that require only the use of the fingers such as pinching (Figure 8d), finger (Figure 8e) and finger-nail impressing, lip flattening, and rim bending, and (4) those that combine some or perhaps all of the above. The consequences of these decorative acts, insofar as they are displayed as redundant vessel surface alterations may be termed decorative elements. By studying them, an analyst should be able to describe the inferred manipulations of the artisan and the kind of tools or substances he or she used in these manipulations. Thus any redundant set of surface alterations that can be systematically linked to the artisan's use of tools, fingers, or extraneous substances is a decorative element. Both prehistoric and modern Native American pots seem to have been most frequently decorated by incising, trailing, impressing (includes both cord marking and cord roughening), punctating, polishing, painting, and/or adding appliqué work to them.

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Figure 8. Decorative Elements. a-Incising; b-Combing; c-Cord Impressing; d-Pinched Nodes; e-Finger Impressing; f-Filleting.

....

Incising

To incise, the artisan drew a pointed and edged tool over the clay at a high oblique angle leaving an incision with a V-shaped trough and a marked wake (Figure 8a). In some cases a multi-pointed carved wood or bone tool often described as a comb seems to have been used to incise parallel lines (Figure 8b). In other instances, (commonly described as stab-and-drag incising), the flat side of a single-edged and

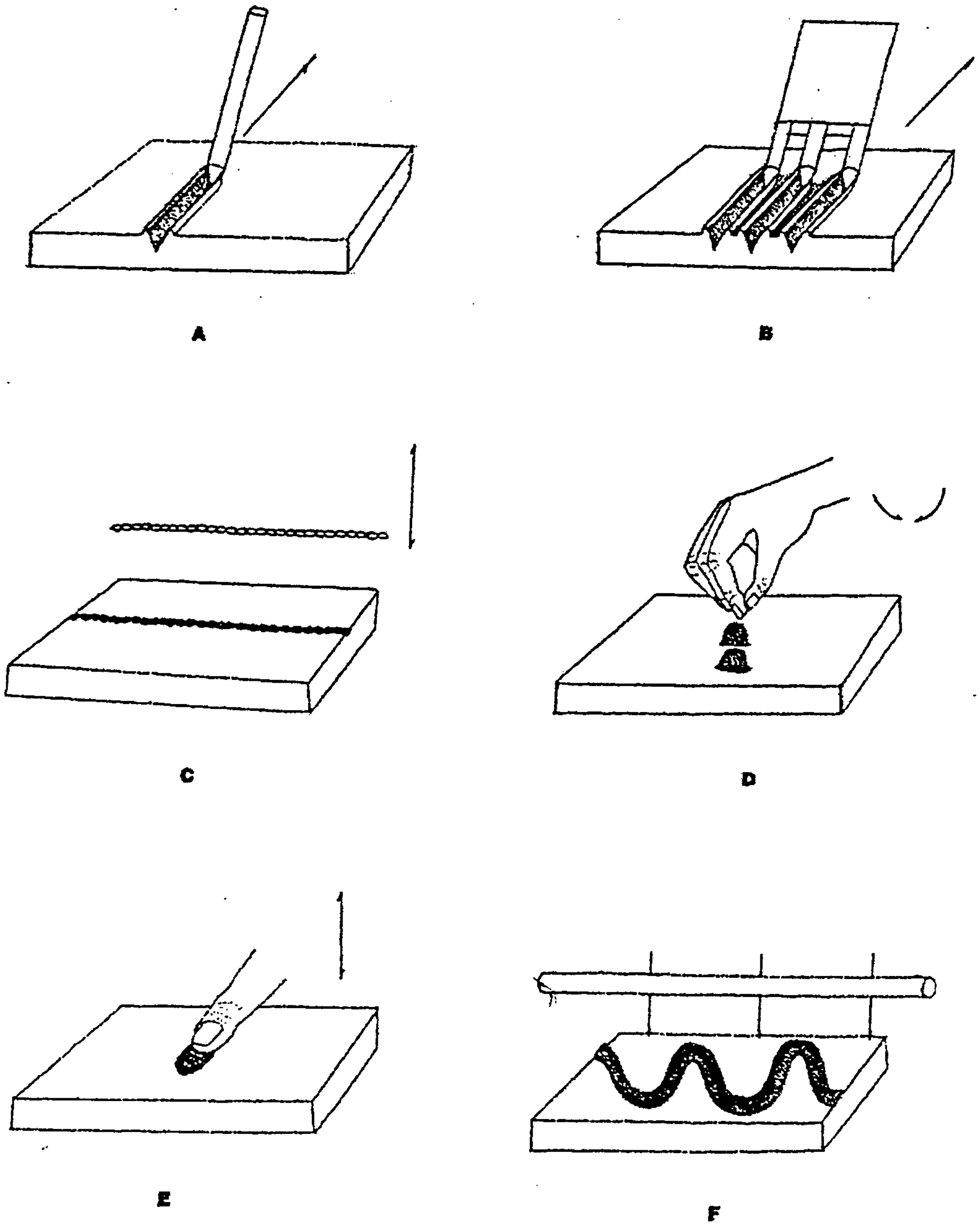

Figure 8. Decorative Elements. A-Incising; B-Combing; C-Cord Impressing; D-Pinched Nodes; E-Finger Impressing; F-Filleting

pointed tool was held against the clay surface, the point of the tool was pushed forward and into the clay at about a ten degree angle, then the tool was pulled back and its flat side dragged over the clay surface (Figure 9f).

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Figure 9. Decorative Elements. a-Tool Impressing; b-Rouletting; c-Punctating with Round Tool; d-Punctating with Triangular Tool; e-Trailing; f-Stab and Drag Trailing.

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Trailing

Trailing, both broad and narrow gauge, (the former sometimes described as channeling or grooving) is a common element of many North American ceramic decorations. Trailing was done with a flat-sided, roughly rectangular tool drawn over the pliable clay at a very low, oblique angle, producing an even-bottomed, U-shaped trough and a shallow wake (Figure 9e). A broader tool produced a broader trough, or channel and a shallower wake, a narrower tool a narrower trough and more substantial wake.

Impressing and Punctating

Tool-impressed designs were most commonly produced by pressing the cut and shaped curved edge of a flat-sided, semi-lunar wood, bone, or shell tool down into the clay with a rocking motion which started nearest the artisan's body (Figure 9a). Tool impressing produced an uneven-bottomed, U-shaped trough with no perceivable wake. If notches had been cut from the curved edge of the impressing tool, or if the edge of a shell was used, its use produced a linear series of holes frequently described as rouletting (Figure 9b). Fabric impressing, with either a single cord (Figure 8e), a mat-like woven fabric, a cord-wrapped paddle, or a cord- or fiber-wrapped dowel repeatedly pressed into the clay have been described as decorative elements on North American wares. Finger and fingernail impressing were also practiced. To accomplish the former, the artisan pressed a finger tip into the clay at an acute angle then withdrew it (Figure 8e); to form the latter, the artisan's finger was pressed into the clay at an oblique angle, leaving only the impression of the finger nail. To produce punctations, the artisan pressed the square, triangular (Figure 9d), or round end of a flat or pointed wood or bone tool (Figure 9c) into the clay and then withdrew it, leaving a hole.

Polishing, Painting and Appliqué

Polishing was accomplished by rubbing a smooth surfaced, oval or round stone

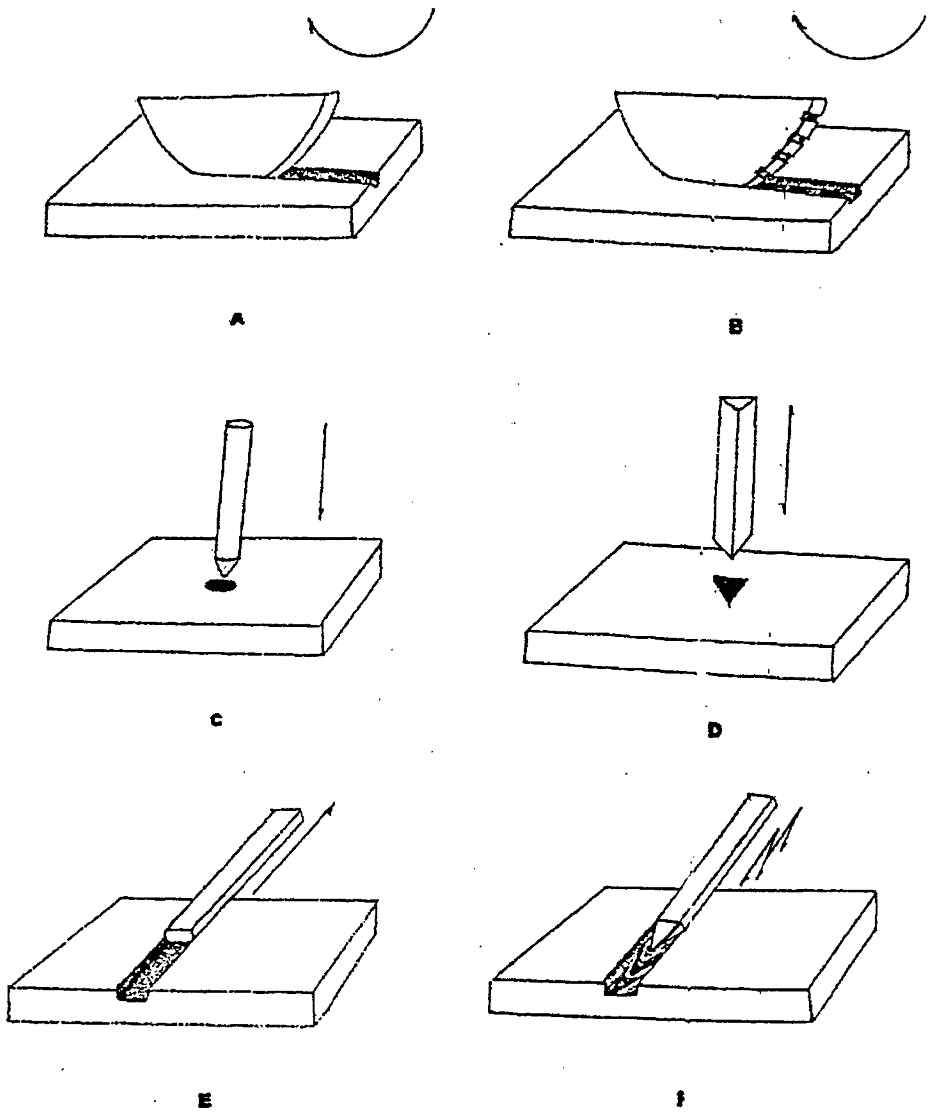

Figure 9. Decorative Elements. A-Tool Impressing; B-Rouletting; C-Punctating with Round Tool; D-Punctating with Triangular Tool; E-Trailing; F-Stab and Drag Trailing

back and forth across the clay until a shiny, compacted vessel surface was produced. It should be noted that polishing after impressing, punctating, incising, or trailing produced cantilevered edges where clean edges or wakes once stood. Polishing after painting produced an attractive lustrous painted surface. Either crushed hematite or magnetite was commonly mixed with water or animal fat to produce a red paint. Mineral and organic paints were used in the Southwestern U.S., with the organic paints being used before their mineral counterparts. The Native American artisan commonly washed or wiped hematite- or magnetite-based paints on vessel surfaces (Krause 1985:82-85, 103-105, 119-121). The use of a slip (i.e., a colloidal suspension of coloring agent and clay), either scrubbed on with a rag or hide or applied as a dip, while rare, has been reported. The use of a brush to apply mineral- or organic-based paints has been reported from the Southwestern and Southeastern U.S. To produce appliqué work, the potter affixed a roll, strap, or a blob of moist clay to the pliable vessel surface, then pushed, pulled, pinched, and/or smoothed it into desired final shape. Appliqué work and paint or slip were usually applied before firing as frequent firing clouds on appliquéd, slipped, or painted surfaces attest, but paint was often applied after stamping, trailing, or incising, as indicated by various instances of paint slopped over into incising, trailing, or impressing troughs. If, for instance, the vessel was to be incised, painted, and polished, then the constituent operations would be performed in the following order: incising first, painting second, and polishing third. In sum, those decorative elements produced by the use of a tool usually precede those requiring the addition of a substance.

Decorative Environment (See Figure 10 for definition).

If we exclude monochrome painting (because if a single color is used, paint is usually applied to the whole of the vessel exterior and/or interior) and vessel exterior polishing then any part of a vessel bearing a single decorative element may be termed a decorative environment. The most common prehistoric and modern decorative environments are the lip, the rim exterior, the rim interior (on vessels with rims), the upper body exterior, and the shoulder. If cord-impressed surface treatments are excluded, the lower body exterior and base are less frequently decorated.

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Figure 10. Primitives and Defined Terms for the Study of Ceramic Decoration

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Designs (See Figure 10 for definition)

Sets of decorative elements that contrast with all others in the same or complementary decorative environments may be considered designs. For the most

FIGURE 10: PRIMITIVES AND DEFINED TERMS FOR THE STUDY OF CERAMIC DECORATION

PRIMITIVES

1. ***Decoration*** (D)	Any ornamentation.
2. ***Feature*** (F)	The empirical result of a decorative act.
3. ***Complement*** (Cp)	One of two mutually completing parts.
4. ***Arrange*** (A)	To put in a replicable order.

Decoration and feature are simple property terms; complement and arrange carry a relational value. The meanings assigned to decoration, complement, and arrange are familiar enough from everyday discourse. Feature warrants the following explication. The identification of a feature requires arguments linking the inferred manipulations of an artisan and the kind of tool or substance he or she used in these manipulations with their tangible results on a pottery vessel.

DEFINED TERMS

1. ***Decorative Element*** (De$\underline{a}$)	A decorative element is by definition any recurrent set of identical feature values. $[(F1\underline{a}).(F2\underline{a}).(F3\underline{a})\ldots(FN\underline{a})] \rightarrow (De\underline{a})$
2. ***Decorative Environment*** (DE1)	A decorative environment is by definition any part of a pot on which a single decorative element occurs. $\{[(L) \text{ or } (Ur) \text{ or } (Sh) \text{ or } (Lr) \text{ or } (R)(Ex) \text{ or } (R)(In) \text{ or } (Bt)]\} \rightarrow (DE1)$
3. ***Design*** (Des)$\underline{y}$	A design is by definition a set of decorative elements that contrast with all other sets of decorative elements in either the same or in complementary environments. $[(De\underline{a})(DE\underline{1})] = [(De\underline{a}!)(DE\underline{1})] \rightarrow (Des)\underline{y}$ or $\{[(De\underline{a})(DE\underline{1})] = (De\underline{a}!)[(Cp)(DE\underline{1})]\} \rightarrow (Des)\underline{y}$
4. ***Design Structure*** (DS)$\underline{y}$	A design structure is by definition the arrangement of members of a set of design elements in the same decorative environment. $[(A)(De\underline{a})(DE\underline{1})] \rightarrow (DS)\underline{y}$

5. *Design Configuration* (DC)

A design configuration is by definition the arrangement of designs on a pottery vessel [(A)(Des)(P)(V)] - (DC)

part both prehistoric and modern Amerindian designs were composed of multiple rectilinear or curvilinear line sets rendered by incising, trailing, impressing, or punctating. These line sets were typically brought into opposition at a 45 or 90 degree angle or intersected at a 45 or 90 degree angle. The appearance of variability was achieved by using differing combinations of design elements in a single or in complementary decorative environments and/or by enclosing one set of design elements within another in the same or in complementary decorative environments. This arrangement of decorative elements in a design may be described as its structure (See Figure 10 for definition). Thus the complexity of North American Amerindian designs was realized through structural means, i.e., it lay in counterpoising design elements and/or nesting one element within another of like or unlike kind (Krause 1994:230-32)

DRYING AND FIRING THE VESSEL

After pottery vessels are shaped and decorated, they must be dried before firing. If insufficiently dried, residual clay body moisture will vaporize within the vessel walls during heating, causing spalling, shattering, and/or warping. Then too, uneven or excessively rapid drying will crack the vessels before they reach a true greenware state. Hence, while the drying period may vary because of differences in temperature, humidity, and the water retentive properties of the clay being dried, most drying is done indoors, i.e., in a structure of some kind, usually a shed or a house.

Firing is a three-stage process. In the first stage the vessel is warmed (the slower the better), and any remaining moisture is driven from the clay body. If warming proceeds too rapidly, the clay particles fuse before residual moisture escapes and pockets of steam form within the vessel walls causing them to shatter and spall. During the second stage organic matter is burned from the clay body and excess oxygen is introduced through circulation drafts. This oxygen reacts with carbonaceous matter in the clay body and soot from the burning fuel to produce carbon dioxide. As carbon in the clay body is removed, the iron oxides that remain are oxidized, producing shades of red, orange, yellow, gray, or brown. Vitrification is the third and final stage. During vitrification clay constituents soften, stick to each other and become joined by glass filaments formed from melting and combining silica. If oxidation is incomplete, as it usually is with sedimentary, i.e., secondary clays, the remaining organic matter will form gas at high vitrification temperatures and the concomitant pressure will cause warping or other forms of wall distortion. Nevertheless, sedimentary clays are usually of low purity and contain natural fluxing agents that produce the beginnings of vitrification at a relatively low temperature (600 to 900 degrees centigrade), thus muting the effects of incomplete oxidation.

Amerindian potters, both ancient and modern, normally open-fired their wares using locally available fuels. The following describes the rudiments of this process. A circular or oval area of suitable dimensions was cleared of overburden, i.e., grass, sod, earth, or sand, and either smoothed to provide a flat surface or dug out to form a shallow concavity. A prepared bed of sticks, grass, and/or bark might then be laid over the bare soil, or the pots to be burned might be set upon stones or potsherds, in either case keeping the unfired vessels off the ground and allowing for a draft during the early stages of burning. The pots to be fired were either placed mouth up or mouth down and nestled into the prepared bed of sticks and grass or arranged upon stones or/or potsherds to hold them upright. They may also have been firmed in their upright stance by leaning them together shoulder to shoulder. A mouth up or mouth down position may be inferred from the smudge patterns noted on the interior or exterior of pot bottoms, on the exterior and interior of lip and near lip portions, and on the exterior surface of the shoulder.

Obviously fuel was stacked over the pots before they could be burned. It is generally presumed that locally available materials were used. Therefore it seems reasonable to suppose that wood, grass, and bark was collected from supplies nearby. Firing clouds with a linear configuration whose size and position indicate the use of sticks or logs may be used to infer fuel composition and stacking techniques. A radial distribution of linear firing clouds may be used to infer a tipi-like frame of sticks or branches; a lattice or dendritic pattern would indicate stacking of a different kind. If a wood framework was used, it was most probably covered over with a thatch of grass and/or bark. If dried dung was also used, it would have been heaped over the thatch. The stack was probably lit on the downwind side (to promote a slower, hotter burn) and additional fuel may have been added as needed during the burn. Most potters seem to have allowed their wares to cool before pulling them from the dying fire, thus preventing undue cracking through rapid heat loss. With the foregoing as a framework for analysis we now turn to a description of the characteristic properties of ceramics derived from several decades of archeological inquiry on the Fort Carson Military Reservation near Colorado Springs, Colorado.

THE FORT CARSON CERAMIC SAMPLE

General Characteristics

In July of 1999 the Fort Carson ceramic sample consisted of 1,052 specimens drawn from 56 archeological sites. One hundred seventy-one of the 1,052 specimens were too fragmentary to allow systematic and meaningful observations to be made or to provide adequate measurements. It should be noted at the outset that the remainder of the Fort Carson specimens were small, having an average length of 2.09 ± 1.0 cm,

an average width of 2.0 ± 1.2 cm, and an average thickness of 7.5 ± 0.7 mm. To provide perspective we measured three additional samples, one from the Tukuto Lake site on the North Slope of Alaska's Brooks Range (207 specimens), one from the West Island site (14PH10) an early Keith variant component in Phillips County Kansas (112 specimens), and the third from the Vohs site (14OB401), a late Keith variant manifestation in Osborn County, Kansas (53 specimens). The specimens from the Tukuto Lake sample were slightly greater than twice as large as those from Fort Carson. They had a mean length of 4.13 ± 1.1 cm, a mean width of 4.10 ± 0.9 cm, and a mean thickness of 11.1 ± 2.0 mm. The sherds from the West Island site were almost twice as large as the pieces from Fort Carson. They had a mean length of 4.33 ± 1.7 cm, a mean width of 3.55 ± 1.3 cm, and a mean thickness of 10.72 ± 1.6 mm. The specimens from the Vohs site were just slightly larger than the sherds from Fort Carson. They had a mean length of 3.30 ± 1.6 cm, a mean width of 2.51 ± 1.1 cm, and mean thickness of 7.33 ± 1.6 mm. All the samples chosen for this comparison were produced and used by members of small and relatively mobile groups of hunters and harvesters between the 6th and 19th centuries. Why the Fort Carson specimens should be the smallest of these is a challenging and perhaps even a theoretically relevant question.

There were 28 specimens in the Fort Carson sample that would traditionally be described as rim sherds. By the criteria introduced previously, however, 9 of these would be most properly described as lip sherds (i.e., were broken from vessels in which the lip and rim were coterminous), 18 were rim sherds (e.g., were large enough to determine that the mouth and lip were separate), and one was too fragmentary to determine if it was a lip or a rim sherd. The remainder of the specimens (910 examples) were clearly body sherds, but of these 139 were broken from a single coiled bowl, 4 were coil fragments, 7 were firing spalls, and 15 were broken from a single corrugated vessel (Figure 12g). To judge by clay-body constituents (i.e., a mica bearing alluvial clay source and grit temper inclusions), all but two specimens were of local manufacture.

All of the rim, lip, base, and body sherds were carefully examined in an attempt to provide an admittedly conjectural account of vessel shape and size, an avowedly risky practice given the small size of individual pieces. There were, for instance, only two unequivocal examples of shoulder sherds, one reconstructable base fragment, and 18 rim sherds. If we assume that the two shoulder sherds and single base sherd were broken from vessels of similar size and shape, then vessel shoulders were (based upon above and below shoulder curve) round and high, while bases were conoidal (Figure 4B). The rim sherd sample, in conjunction with the assumed round and high shoulder, suggests that vessel mouths (and/or lips on rimless vessels) were slightly constricted (estimated to be from 1/3 to 1/4 smaller in diameter than the shoulder),

and rims (on rimmed vessels) were direct, i.e., lip and mouth diameters were virtually identical (Figure 12 a-f).

Of the 716 measurable body sherds, 392 (53.2%) were broken from the vessel body between its high rounded shoulder and its mouth or lip, i.e., were upper body sherds. These pieces had a mean thickness of 6.4 ± 0.6 mm. Two hundred twenty seven pieces (32.4 %) were identified as broken from below the shoulder but above the base, i.e., were lower body sherds. These had a mean thickness of 7.8 ± 0.4 mm. Ninety-seven sherds (14.4%) with a mean thickness of 8.8 ± 0.7 mm had the curved external and internal surfaces expected of base fragments. A single base-forming technique (i.e., excavated and mass-modeled) and two separate body-forming techniques (i.e., coiled and mass-modeled) were clearly indicated. The sample included 153 clearly mass-modeled body sherds (24.7% of all body sherds suitable for observation and measurement) and 466 coiled specimens (75.3% of all body sherds suitable for observation and measurement). One hundred twenty-six (82.4%) of the mass-modeled sherds had been broken from the upper body and 27 (17.6%) from the lower body. Two hundred and sixty-six (57%) of the coiled sherds had been broken from the upper body and 200 (43%) from the lower body. The exterior surfaces of all upper and lower body sherds and of some but not all bases had been impressed with a cord-wrapped paddle applied at a right angle or near right angle to the long axis of the pot (Figure 11b and e; Figure 12a-f). With the general characteristics of the Fort Carson sample as a background, let us now turn to a more detailed description of its composition viz-`a-viz techniques of manufacture and decoration. For this task we shall present the information the sample provided in the format of a production stage grammar, i.e., we shall attempt to recreate the order and content of the various steps in the assumed procedure of producing a pottery vessel. In so doing we shall summarize (1) the steps in our inquiry, (2) the observations taken, and (3) the inferences drawn under what we take to be appropriate headings and subheadings

Raw Material Acquisition and Processing

The cross-sections, and the interior and exterior surfaces of all the specimens in the Fort Carson collection were examined under a swing arm–mounted, circumferencially illuminated 3X magnifying lens. All but two of the pieces examined had been manufactured from a fine-grained clay that contained relatively uniform amounts of small mica flecks. All but one of them also contained variable amounts of finely ground granitic stone. There were only 7 firing lamina, or spalls (i.e., thin oval fragments with a cord-impressed exterior surface and raggedly fractured interior surface), and only a few (52 recorded instances) small lacunae left by incinerated organic inclusions among the 1,052 specimens in the collection. We therefore assumed that local mica-containing secondary clay beds (indicated by the fine grain

size and the few small lacunae recorded) were the most likely raw material source. We further supposed that the clays dug from these sources were dried, pounded, and cleaned of the larger organic (i.e., twigs, grass, etc.) and inorganic (i.e., stones, etc.) impurities they may have contained. This procedure would account for the relatively sparse and small lacunae in our sample and for the universally small flecks and relatively homogeneous amounts of mica. Then too, the few firing lamina in the sample suggest that the potters understood the water-retentive properties of the clay they used and exercised at least some control over the amount of moisture the clay contained in its paste state. We further assume that fine-grained granitic rocks were pounded and ground to a near sand state then most probably kneaded into the mica-bearing clay paste to temper it.

Technique of base Manufacture

The sample included 97 specimens presumed broken from vessel bases. While the upper portions of some of these were coiled the bottom and near bottom sections did not exhibit coil fractures, coil overlap ridges, or coil juncture troughs. Nor could coils be seen in the bottom proximal portions of any of them even under magnification (Figure 11c). We noted a distinct convergence and, in a number of cases, a partial overlap of cord-wrapped-paddle impressions on the upper, (i.e., lower body proximal) exterior surfaces of presumed base sherds (Figure 11b). There were either smoothed-over cord impressions, or no cord impressions at all on the exterior surfaces of bottom proximal portions. We further observed a cluster of 4 finger indentations (mean width of 1.05 ± 0.4 cm, mean length of .68 ± 0.2 cm, mean depth of 0.7 ± 0.9), all with cantilevered edges (indicating subsequent smoothing on the interior surface), adjacent to but above the presumed bottom of the reconstructed conoidal base (Figure 11a). Five similar indentations (mean width of 1.36 ± .16 cm., mean length of 1.86 ± 0.2 cm, mean depth of 0.6 ± 0.8 cm) were found on the bottom proximal interior of another base fragment (Figure 11d). There were two cantilever- edged (i.e., smoothed over) finger indentations (1.9 and 2.0 cm wide, 2.5 and 2.2 cm long, and 0.2 cm deep) in a third and a single smoothed-over finger indentation (1.5 cm wide, 2.5 cm long, and 0.3 cm deep) in a fourth. This admittedly scanty array of evidence led us to infer that bottoms were most probably constructed by excavating a prepared clay mass and then pulling and scraping it into the desired conoidal shape, while upper bases were either mass-modeled (Figure 11C) or coiled (Figure 11f).

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Figure 11. Base Fragments

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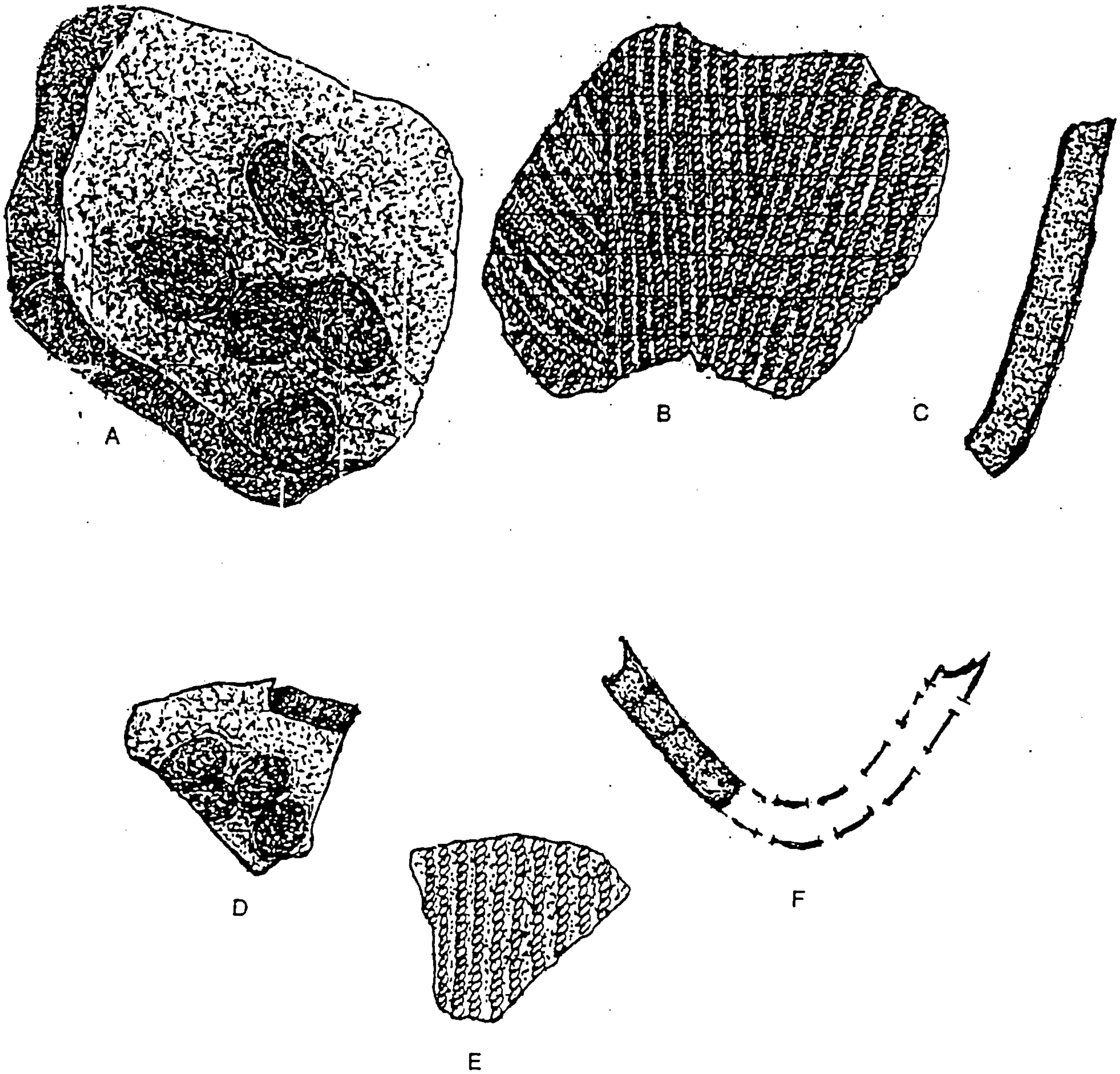

Figure 11. Base Fragments

Techniques of Lower and Upper Body Construction and Decoration

The non-base sherds in our sample were first divided into upper and lower body fragments on the basis of surface curvature. To accomplish this end we assumed a high round-shouldered vessel with slightly constricted mouth (Figure 4b). We next examined all the rim and lip sherds, with special attention to the surfaces adjacent to and immediately below these landmarks. Lips were easy to properly orientate, and on both rimmed and rimless vessels (by projection) they transcribed a circle. Hence, we assumed that all points systematically related to this circle were topological invariants to which we might relate multiple instances of surface treatment. In all cases the exterior surfaces of rims, near lips and adjacent upper body portions were cord-impressed. In every case the cord impressions were applied with a cord-wrapped paddle held at a right angle to the long axis of the pot (i.e., at a right angle to the lip). We therefore felt justified in identifying as top or bottom, opposing edges of any piece whose edges lay at a right angle to the cord impressions on its exterior surface. Once standards for orientating pieces had been established and the pieces themselves orientated, we placed them on a flat surface. If the top and bottom (or upper and lower) edges of a piece rested on a flat surface (in the case at hand, a table) but its center or near center did not, the piece was grouped with all others that met this criterion and was identified as a member of set A. If the center or near center of a piece as well as its top and bottom edges rested on a flat surface it was grouped with others of like kind and identified as a member of set B. Since we assumed that upper body sherds would be more dramatically curved then lower body fragments the members of set A were identified as upper body fragments and those of set B as lower body sherds.

We realize that this rough and ready procedure is a questionable one. If our vessel shape conjecture is wrong (i.e., if the pieces being sorted were not broken from high, round-shouldered vessels with slightly constricted mouths) then our identifications would be of little or no value. It was for this reason that we measured the maximum vessel wall thickness for all pieces identified as lower and all specimens identified as upper body fragments. We were, however, reasonably sure that the potters who produced these specimens started by excavating a base. We also suspected that they proceeded by either coiling or mass-modeling the lower body, then the shoulder, and then the upper body (i.e., worked from the bottom up). We therefore predicted that base fragments would be significantly thicker then lower body sherds, and that lower body fragments would be significantly thicker than upper body pieces. We found that base sherds (sample size 97) had a mean thickness of 8.8 ± 0.7 mm, lower body sherds (sample size207) had a mean thickness of 7.8 ± 0.4 mm, and upper body sherds (sample size 392) a mean thickness of 6.4 ± 0.6 mm. A student

t test of the difference between average upper and average lower body thickness yielded a score of –34.04. The same test for differences between average lower body and average base thickness yielded a score of –13.10. When applied to the differences between average upper body thickness and average base thickness, the student t statistic yielded a score of –31.06. All three scores indicate that the differences in thickness are significant at the .001 level of confidence.

The upper and lower edges and cross-sections of all upper and lower body sherds were examined under illuminated magnification in an attempt to determine if they were coiled or mass-modeled. If either upper or lower edge, or in some cases both edges, exhibited a clear coil fracture, the piece was assigned to the subclass upper body coiled or lower body coiled. Then too, if suspected instances of coil fractures were visible on either or both edges, the piece was further examined under illuminated magnification for indications of smoothed-over coil junctures in the form of surface irregularities that corresponded with observable clay body discontinuities in sherd cross-sections. In suspect cases it was often desirable to view both near and far cross-sections of a piece at once, a task accomplished by using a dental mirror to reflect the far cross section view while observing its near counterpart under illuminated magnification. These procedures allowed us to add specimens to the two subclasses with at least a modicum of confidence and precision. Upper and lower body sherds (orientated using the same criteria as coiled specimens) whose top and bottom edges were clearly not formed by coil junction fracturing, and which had no observable clay body discontinuities that could be correlated with surface irregularities were identified as mass-modeled. When finished we had divided the sample as follows: (1) coiled upper body fragments (266 specimens), (2) coiled lower body fragments (200 specimens), (3) mass-modeled upper body fragments (126 specimens), and (4) mass-modeled lower body fragments (27 specimens).

Given the statistically significant difference in upper and lower body thickness for all specimens we decided to ask four additional questions of our samples: (1) are lower bodies on coiled specimens significantly thicker then upper bodies, (2) are lower bodies on mass-modeled specimens significantly thicker than upper bodies, (3) are coiled upper bodies significantly thinner or thicker than mass-modeled upper bodies, and (4) are coiled lower bodies significantly thinner or thicker than mass-modeled lower bodies. The coiled lower body sherds in our sample (200 specimens) had a mean thickness of 7.7 ± .09 mm., and the coiled upper bodies (266 specimens) a mean thickness of 5.9 ± 0.0 mm. A student t score of –213.7 indicated a significant difference at the .001 level of confidence. The mass-modeled lower body sherds in our sample (27 specimens) had a mean thickness of 6.7 ± 1.1 mm, and the mass modeled upper bodies (126 specimens) a mean thickness of 4.8 ± .79 mm. A student

t score of –8.52 again indicated a significant difference at the .001 level of confidence. When coiled upper bodies (266 specimens) were tested against mass modeled upper bodies (126 specimens) a student t score of –15.58 indicated a significant difference, i.e., the coiled upper bodies were significantly thicker than the mass-modeled upper bodies at a .001 level of confidence. Coiled lower bodies (200 specimens) with a mean thickness of 7.7 ± .09 mm were also significantly thicker than mass-modeled lower bodies (27 specimens) with a mean thickness of 6.7 ± 1.1 mm (t = -4.72, significant at the .001 level of confidence).

Although the length and width of coiled and mass-modeled specimens seemed by inspection to be insignificant, we decided to test these measurements as well. Here again we asked four questions: (1) are coiled upper and lower body pieces significantly different in length and width, (2) are mass-modeled upper and lower body pieces significantly different in length and width, (3) are coiled upper body pieces significantly different in length and width than mass-modeled upper body fragments, and (4) are coiled lower body sherds significantly different in length and width than mass-modeled lower body sherds. With respect to coiled upper and lower body sherds, mean lengths for upper (266 specimens) were 1.97 ± .92 cm and for lower (200 specimens) 2.19 ± .87 cm. A student t score of 1.63 indicates no significant difference between the two. Mean widths for coiled upper and lower body sherds were (upper 266 specimens) 1.95 ± 1.2 cm and (lower 200 specimens) 2.15 ± .84 cm. A student t score of 2.11 indicates no statistically significant difference in coiled upper and lower body width. Mass-modeled upper body sherd length was 2.2 ± 2.09 cm and lower body sherd length 2.9 ± 1.9 cm. A t score of 1.70 indicates no statistically significant difference. Mass-modeled upper body fragment width was 2.17 ± 2.5 cm, and lower body sherd width was 2.3 ± 1.8 cm. A student t score of 0.24 indicates no statistically significant difference. When coiled upper body fragment lengths were tested against mass modeled upper body sherd lengths a student t score of 1.23 indicated no significant difference and when coiled lower body fragment lengths were tested against mass-modeled lower body sherd lengths a student t score of 1.91 indicated no significant difference. The same was true of coiled versus mass-modeled upper and lower body widths. In sum, lower bodies were significantly thicker than upper bodies on both coiled and mass-modeled specimens, and coiled upper and lower body specimens were significantly thicker than their mass-modeled counterparts.

The specimens in these four classes were further examined for additional information on techniques of production. When viewed in cross-section the 47 largest coiled specimens exhibited 83 coil breaks that could be sorted into three kinds. One kind had two narrow ridges (one of them exterior surface proximal and one them

interior surface proximal), with an intervening (i.e., cross-section central) trough, and the second had two narrow troughs (one of them exterior surface proximal and one interior surface proximal) flanking a (cross-section central) ridge. The third kind had a narrow exterior proximal trough and a single extended and tapered interior surface proximal ridge. The first two of these we recorded as ∪ -shaped, the second as ∩-shaped, and the third as J-shaped.

Eleven of the sherds examined had a single coil break, and 36 had two breaks. Forty-nine of the coil breaks (59%) were ∪-shaped, 24 (29%) were ∩-shaped, and 10 (12%) were J-shaped. Forty-three (88%) of the ∪-shaped breaks occurred on upper body sherds, 6 (12%) on lower body sherds. Twenty (83%) of the ∩-shaped breaks occurred on upper body sherds, and 4 (17%) on lower body sherds. No J-shaped breaks were found on upper body sherds, and 10 (100%) were encountered on lower body sherds. The apparently exclusive occurrence of J-shaped breaks on lower body fragments led us to reexamine our sample with an eye to the occurrence of J-shaped breaks on the remainder of the sample's coiled upper and lower body sherds. We could not find a single clear, or even an equivocal, example of a J-shaped break on the 229 remaining upper body sherds but were able to discern 70 additional J-shaped breaks on 200 lower body sherds. This evidence led us to suspect that both the ∪-shaped and the J-shaped breaks reflected the balance between episodes of exterior and interior wall wetting and scraping after the vessel had been formed. If our conjectural vessel morphology is correct, or nearly so, the most vigorous interior scraping should be found on the lower vessel walls. If the potters were using vigorous episodes of interior scraping and less forceful episodes of exterior scraping to fine-shape the lower vessel walls, this practice would account for the J-shaped fractures found in the sample of lower body sherds. The upper vessel interiors could not have been as vigorously or as consistently scraped as lower vessel interiors. This would account for the greater balance between exterior and interior scraping reflected in the ∪-shaped and ∩-shaped fractures frequently found on coiled upper body sherds but less commonly found on (what we presume was) the upper interior of lower body sherds.

Further, we suspected that if lower body interiors were vigorously scraped with a tool held in one hand, then the opposing exterior surface would have been supported by the rigid palmar surface of the other hand. This operation, depending on the vigor of scraping and the pressure applied from the exterior, should have elongated the coils that formed the lower body. We were able to assemble a sample of 19 upper body sherds, each with two or more clearly visible and measurable coils and 10 lower body sherds that met the same criteria. The 19 upper body sherds had a total of 78 visible and measurable coils, their 10 lower body counterparts a total of 32 visible and measurable coils. All the upper body sherds exhibited near-circular coils

as did two lower body fragments. The 32 measurable coils in the 8 remaining lower body fragments were oval. The mean height and width measurement for upper body coils was 6.2 ± 1.1 mm. The mean height of lower body coils was 12.0 ± 3.6 mm, and mean width was 7.9 ± 1.1 mm. The difference ($t = -8.94$) was significant at the .001 level of confidence.

A careful examination of the exterior and interior surfaces of both coiled and mass-modeled upper and lower body sherds was also revealing. The interior and exterior surfaces of both coiled and mass-modeled specimens had been scraped before the interior surface was dried and the exterior surface was cord-impressed. We encountered 12 clear finger impressions on the interior of coiled vessels, 9 of them on upper body interiors and 3 on lower body interiors. They ranged from 1.5 to 2.5 cm in length (mean 1.61 ± .45 cm), and from 1.3 to 2.2 cm in width (mean 1.70 ± .45 cm) and varied from 1.0 to 2.0 mm in depth. Since none of them had cantilevered edges, i.e., had not been smoothed over, we assumed that they represented attempts to support the vessel's interior surface while the opposing exterior was being cord-impressed. Two clear finger impressions (one of them 1.5 cm long, 1.1 cm wide, and 2 mm deep; the other 1.2 cm long, 1.1 cm wide, and 2 mm deep) were found on the upper interior of mass-modeled vessels. Neither of these had been smoothed over. They both accompanied clear, oval, non-smoothed-over anvil scars. Three additional oval, non-smoothed over anvil scars were identified on the upper interior surfaces of mass-modeled vessels, leading us to suspect that both fingers and oval stone anvils were used to support the interior surfaces of mass-modeled vessels, while the opposing exterior surfaces were being cord-impressed. The 5 anvil scars in our sample varied in length from 3.0 to 5.0 cm (mean of 3.5 ± .87 cm), in width from 3.0 to 3.8 cm (mean of 3.4 ± .40 cm) and in depth from 1 to 2 mm.

The exterior surfaces of all mass-modeled specimens had been scraped smooth then, to judge by the vertical or near vertical markings had been impressed with a cord-wrapped paddle applied at a right angle to the long axis of the pot while the vessel was held in an upright position. The cords were two-strand s- or z-twist fibers wound about a rectangular wood or bone paddle. We could not determine the paddle width, but we could calculate the number of cord impressions per centimeter of impressing surface on 7 exterior surfaces. The number of impressions varied from 6 per 1.5 cm (i.e., 1 impression per 2.5 mm) of paddle surface to 8 per 1.7 cm (i.e., 1 impression per 2.1 mm) of paddle surface. The impressions were clear and evenly spaced on upper body exteriors. On lower body exteriors the impressions were also clear and were evenly distributed, but tended to converge as the vessel base was approached. There were no over-stamped surfaces that would indicate that the cord-wrapped paddle was used with enough force to shape or compact vessel walls, i.e., was

a component of manufacture as opposed to being a technique of decoration.

The exterior surfaces of all coiled specimens had also been scraped but had then been floated prior to cord-impressing them. Floating was presumably accomplished by wetting the exterior surface, then gently pressing and smoothing it with a flat-sided wood or bone tool. This practice left a smooth and compact eggshell-thin surface that could be easily seen in sherd cross-sections and could be removed by inserting the tip of a knife blade beneath it and prying upward. In most cases the exterior surface cord impressions distorted but did not penetrate this floated surface. Here again the vertical or near vertical markings had been impressed with a cord wrapped paddle applied at a right angle to the long axis of the pot while the vessel was held in an upright position. Like their counterparts on mass modeled specimens the cords impressed on the exteriors of coiled vessels were two strand s- or z-twist fibers wound about a rectangular wood or bone paddle. Again we were unable to determine the paddle width but could calculate the number of cord impressions per centimeter of impressing surface on 21 exterior surfaces. The number of impressions varied from 5 per 1.0 cm of paddle surface to 7 per 1.4 cm (i.e., 1 impression per 2 mm) of paddle surface. Here too, the impressions were clear and evenly spaced on upper body exteriors, and on lower body exteriors they were evenly distributed but tended to converge as the vessel base was approached.

The care and precision with which the cord-wrapped paddle had been applied to the exterior of both mass-modeled and coiled body surfaces led us to suspect that this practice was probably of greater decorative than body-shaping value. None of the exterior body surfaces were overstamped, nor were the stamped surfaces deeply impressed. Then too, on coiled specimens the exterior surface had been floated, we presume, to fill in and smooth over any residual surface troughs that might be present. Differently put, we presume that the exterior surfaces of coiled specimens had been prepared to receive the cord impressing much as the decorative surfaces of some lip and rim exteriors (8 examples) had been smoothed over before they received incisions or punctations. In two instances, parallel horizontal incised lines had been cut through vertically cord-impressed near-lip surfaces much as vertically or diagonally incised parallel lines had been cut through horizontally incised lines on smoothed-over near-lip surfaces.

In sum, all but two of the Fort Carson specimens were produced from local mica-bearing clays. One exception was a sand-tempered glaze paint sherd (probably a fragment of Rio Grande Glaze paint ware from site 5PE56). The other exception (from site 5PE1861) was a grit-tempered piece made from a non-local clay source that fired pinkish-grey. The local clays were apparently dried and presumably pounded

and then re-hydrated, and in the paste state tempered with finely crushed granitic rock. With the exception of one coiled, round-bottomed, high-shouldered, round-lipped but rimless bowl (represented by 139 fragments from site 5FN291), all bases were mass-modeled and conoidal. Since bases were significantly thicker than lower and upper body fragments, and lower body fragments were significantly thicker than upper body fragments, we presumed that Fort Carson's various potters began by constructing the vessel's base, then proceeded to form the vessel's lower body, shoulder, and upper body. While the majority of the lower and upper body fragments in the sample (sample size 619) were coiled (466 specimens or 75.3%), a significant minority (153 specimens or 24.7%) were mass-modeled. Six sites (11.1%) yielded only mass-modeled ceramics. Both mass-modeled and coiled specimens, in varying proportions, were drawn from 10 sites (18.5%). Thirty-four sites (64.8%) contained only coiled specimens. Three sites (5.6%) contained only base fragments. Fifteen coiled upper body fragments from site 5PE868 would customarily be described as corrugated. Differently put, the coils had been left as they had been stacked on the outer surface, but had been welded together on the interior surface by vigorous scraping, wetting, and smoothing.

Techniques of Lip and Rim Construction and Decoration

The Fort Carson ceramic sample contained 18 rim sherds (i.e., pieces with mouth, lip, and intervening surfaces) drawn from 8 sites and 10 lip sherds (i.e., lip coils applied directly to the uppermost portion of the upper body) derived from 5 sites. The lips on all rim sherds had been constructed by adding a coil of clay. In 12 instances (66% of the time), this lip coil had been flattened by pressure from the palmar surface of a finger or thumb to produce an upper profile with two 90-degree angles and a flat-running surface between them. In 3 cases (17% of the time) the lip coil had been rounded and smoothed, most probably by holding a piece of hide between the thumb and upper forefinger while drawing the hand around the lip circumference. In three cases the lip coil had been broken away, leaving a ᴗ-shaped coil break. Three of the 10 lip sherds (i.e., 30%) had flat lips produced in the same way as those on rim fragments, and 5 (i.e., 50%) had been rounded using the same procedures that produced their rim fragment counterparts. The coils on two specimens had been broken away, leaving the signature ᴗ-shaped fracture. While the sample size makes any generalization questionable, there does seem to be a preference for flat lips on specimens with rims and round lips in those cases in which lip and mouth are coterminous. Four of the ten lip sherds had been vertically cord-impressed from upper body to upper lip exterior. On two additional sherds the lip proximal portion of the upper body had been smoothed, then incised. One of these had been incised with a single horizontal line immediately below the lip. This single line had

then been cut through at a 45-degree angle by at least one and probably more incised diagonal lines. The other sherd had two parallel horizontal incised lines that encircled the mouth just below the lip. Yet another specimen had been vertically cord impressed to the upper, outer edge of the lip, and the cord impressing subsequently cut through by a single incised line that encircled the mouth immediately below the lip. Two additional pieces had round, diagonally notched lips and smoothed lip proximal upper body surfaces that had been incised. One had vertical incised lines cut through at a right angle by two horizontally incised lines. The other had three parallel horizontal incised lines cut through at a 45-degree angle by incised diagonal lines. A single round-lipped specimen had been smoothed on the mouth proximal portion of the upper body. A final near-lip piece had been smoothed and then decorated with a line of horizontal punctations nested in two parallel horizontal incised lines that encircled the upper body just below the mouth.

By our previously introduced criteria, 10 of the 18 rim sherds (56%) could be easily and consistently described as direct and high (mean height of 35.1 ± 8.8 mm), and 8 (44%) as direct and low (mean height of 16.1 ± 3.9 mm). A student t test of paired means yielded a score of –6.15, indicating a significant difference at the .001 level of confidence. The rim sherd sample contained four direct high-rimmed specimens of two-strap construction. Two of them were added to mass-modeled upper bodies [one from 5PE1798, (Figure 12d), the other from 5PE56] and two to coiled upper bodies [one from 5PE56 (Figure 12e), the other from 5PE333 (Figure 12f)]. In these cases, however, the upper and lower rim straps were minimally overlapped, giving the rim a slight bulge near its midpoint but not producing the wedge-shaped profile typically described as collared. All four had been vertically cord-impressed on the rim exterior and all had flat lips, three of them undecorated and one notched with deep, parallel, diagonal incisions. The lower rim straps were 19, 20, 22, and 25 mm high, and 7, 9, 7.5 and 9 mm thick. The upper rim straps were 18, 17, 24, and 29 mm high, and 6, 9, 7.5, and 8 mm thick. Upper straps were overlapped with lowers by 6, 5, 5, and 7 mm, giving each a slight bulge in the middle. Thickness measurements at rim base, midpoint, and near lip were as follows: 8, 10, 8, and 7 mm; 9, 11, 10, and 8 mm; 7, 8, 7, and 6 mm. High rims of virtually identical construction and decoration, all however affixed to mass-modeled bodies, have been described from Lahoff (25FR28) and Calumet Creek (25FR29) in Frontier County, Nebraska (Krause 1995:340-42). Both are Plains Woodland stage sites presumably belonging to a late phase of the Keith variant dating to between A.D.700 and 900 (Krause 1995:348).

Three of the direct high-rimmed specimens, all of them typically described as collared, were affixed to mass-modeled upper bodies [one from 5PE56 (Figure 12a),

the other two from 5PE868 (Figure 12b and c)]. To produce these rims the potter used two straps of clay and a lip coil proceeding as follows. A first, or lower, strap of clay, most probably formed by flattening a thick coil, was added to the upper exterior of the upper body. In the 3 cases at hand, this strap was 27 mm high and 8 mm thick, 26 mm high and 6 mm thick, and 26 mm high and 6 mm thick. Then a second strap, formed in the same manner as the first, was added to its upper exterior. These straps measured 19 mm high and 6 mm thick, 16 mm high and 5 mm thick, and 13 mm high and 6 mm thick. These second, or upper, straps overlapped their first strap counterparts by 18 mm, 16 mm, and 13 mm, thickening the rim and giving its profile a wedge-shaped appearance. The rim was completed by adding a lip coil to the uppermost surface formed by the overlapping straps, as indicated by two lip coil fractures and one round lip. Two of the three had been cord-impressed on the rim exterior; one carried a rectilinear series of stab-and-drag punctations on the rim exterior. Virtually identical rim construction and decorative techniques occur on specimens with mass-modeled upper bodies in sites of the Sumpter and Dubert subphases (ca AD 850 to AD 1350) of the Solomon River phase in north-central Kansas (Krause 1995:321-26). Similar rim and body construction techniques have also been reported for Upper Republican Phase (ca. A.D.1100 to A.D.1350) sites in south-central and southwestern Nebraska.

The three remaining direct high-rimmed specimens had been coiled from mouth to lip. One of them (from 5PE868) had a round lip (Figure 12g), one (from 5PE56) had a flat lip, and one had the lip coil broken away (from 5PE868). The round-lipped specimen had been built to a height of 32 mm by adding 4 8-mm-diameter coils between mouth and lip, then affixing a lip coil 6 mm in diameter (i.e., a total height of 38 mm). The rim exterior had been vertically cord-impressed to the lip. The flat-lipped rim had been built up to a height of 28 mm using 4 7-mm-diameter coils, then topping the uppermost with a 5-mm-diameter lip coil that was flattened to 2 mm, giving the flat lip an inverted L-shape (i.e., a total height of 30 mm). This specimen had also been vertically cord impressed to the lip. The third specimen had been manufactured by stacking 3 9-mm-diameter coils atop one another from mouth to lip, producing a 27-mm-high rim, then adding a lip coil (estimated to be ca. 8 mm in diameter) that had subsequently been broken away (i.e., an estimated total height of 35 mm). Like the other coiled high rimmed specimens this piece had been vertically cord-impressed, but in this case three parallel horizontal incised lines that presumably encircled the rim exterior had been cut through the cord impressing midway between the lip and lower rim–upper body junction. Since all three coiled high rims had been broken away at the upper body–lower rim junction, we suspected that rims were affixed to the upper body as a unit. In other words we suppose that either 3 or 4 rim coils had been laid one atop another and then pressed and smoothed

into a strap that was added to the upper body as a unit. We further suspect that the lip coil was affixed to the upper edge of this strap after it was joined to the uppermost upper body coil.

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Figure 12. Rim Sherds and Corrugated Ware. a-g Rim Sherds; h-Corrugated Ware Sherd

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Seven of the direct and coiled low-rimmed specimens were constructed of two rim coils plus a lip coil, and one was formed from a single rim coil plus a lip coil. Six of the lip coils had been flattened (75%) and two rounded (25%). Again, we suspected that the two rim coil specimens (drawn from sites 5EP52, 5EP1080, 5EP1672, 5PE56, 5PE333, and 5PE623) had been pressed into a strap that was added to the upper body as a unit. The single rim coil piece (from 5PE648) obviously was not. A comparison of mean coil diameters for high- and low-rimmed specimens revealed no significant difference; the potter merely used twice the number of coils to produce high as opposed to low rims. A comparison of mean rim coil diameters with mean upper body coil diameters was however instructive. The mean upper body coil diameter (sample size 78) was 6.20 ± 1.1 mm. The mean rim coil diameter (sample size 11) was 7.72 ± 0.8 mm. A comparison of means t-score of -4.42 indicated a significant difference. Nevertheless, we could not match specific upper body pieces with the rim fragments they once supported; hence we hesitate to attribute this difference to our admittedly speculative account of coiled rim manufacture. We will thus confine ourselves to noting that rim coils were significantly thicker than upper body coils. Six of these low, coiled rims carried vertical cord impressions that ran from upper body to lip. One specimen had been smoothed over the entire rim exterior, and one carried a horizontal line of oval punctations nested in horizontal incised lines, each punctate separated from its nearest familiar partner by 4 vertically incised lines.

To sum up, the potters who produced the specimens in the Fort Carson lip and rim sherd sample made both rim bearing and rimless vessels. When a rim-bearing vessel was produced, the rim was direct (i.e., mouth and lip diameters were approximately equal), but could be either high or low. High rims could be constructed of straps of clay or coils of clay; in either case we suspect they were attached as units. Two straps of clay might be maximally overlapped to produce a collar or minimally overlapped to produce a tall rim with a slight bulge near its mid-point. Coils of clay were used to produce both high and low rims, the difference being that coiled high rims were built of roughly twice the number of coils used to construct low rims. Lips were either flattened or rounded, with a preference for

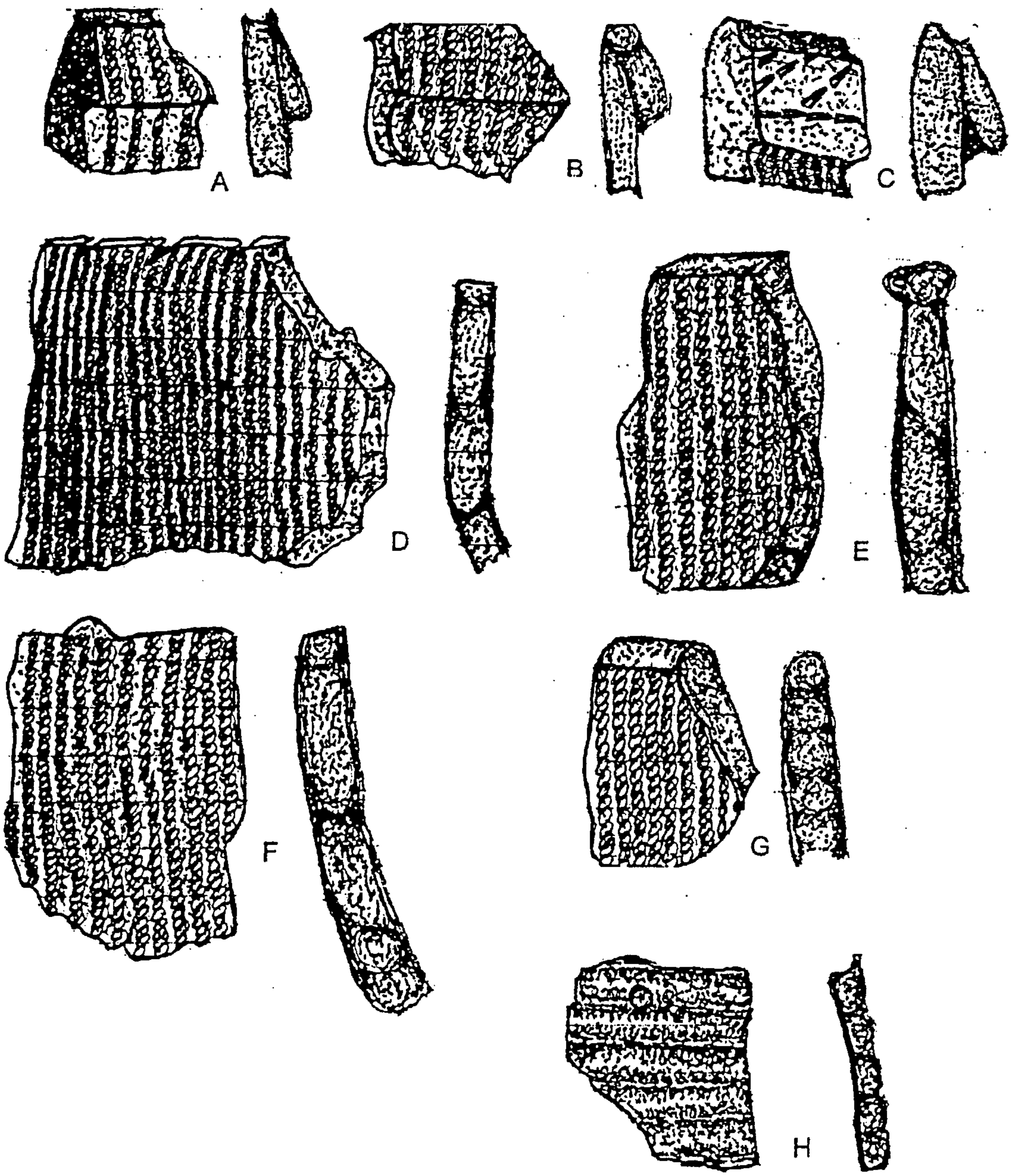

Figure 12. Rim Sherds and Corrugated Ware
A-G Rim Sherds
H-Corrugated Ware Sherd

rounded lips on rimless vessels and flattened lips or rim-bearing vessels. The decorative techniques included: (1) cord-wrapped-paddle impressing (applied at a right angle to the long axis of the pot to produce vertical impressions); (2) oval and round punctations (applied in a single horizontal line nested in incised, horizontal lines or incised, horizontal and vertical lines); (3) incising (rendered as parallel horizontal, vertical, or diagonal lines, in some cases intersecting at a 45 or 90 degree angle); and (4) stab-and-drag incisions. The decorative areas on rim-bearing specimens included lip and rim exterior, on rimless pieces lip and lip proximal upper body surface. Insofar as vertical cord impressing was a decorative technique, the vessel body exterior on both rim-bearing and rimless vessels constituted a single decorative area.

DISCUSSION AND INTERPRETATION

If we assume that mas-modeled lower and upper body construction preceded its coiled counterpart, then an interesting and orderly arrangement of sites may be posited. There were, for example, 6 sites (namely, 5PE833, 5PE336, 5PE1798, 5PE883, 5EP162 and 5EP1213) that yielded only mass-modeled wares, and thirty four sites contained only coiled wares (namely, 5PE8, 5PE63, 5PE165, 5PE323, 5PE326, 5PE328, 5PE333, 5PE338, 5PE639, 5PE649, 5PE896, 5PE897, 5PE904, 5PE910, 5PE915, 5PE919, 5PE925, 5PE1047, 5PE1571, 5EP52, 5EP56, 5EP141, 5EP163, 5EP165, 5EP1208,5EP1216, 5EP1339, 5EP1347, 5EP1672, 5FN180, 5FN181, 5FN183, 5FN184, and 5FN291). Now if we posit that coiling replaced mass modeling we may order the 10 sites that contained examples of both construction techniques as follows:

Site:	% mass-modeled	%coiled
5EP143	80	20
5PE60	50	50
5EP149	50	50
5FN503	34	66
5PE623	34	66
5PE648	31	69
5PE868	30	70
5EP1080	25	75
5PE56	16	84
5EP1192	14	86

There are radiometric determinations from two of the sites in this presumed

sequence, Avery Ranch (5PE56) and Recon John Shelter (5PE648). Nine radiometric determinations from Avery Ranch suggest an occupation between AD 1020 and AD 1290 (Zier et al. 1990:154). The apparent bimodal distribution of dates (in the form of two date clusters), from a site that by all other indications was briefly occupied leads us to view all the dates with caution (Zier et al. 1990:161). Then too, the single piece of sand-tempered glazed paint pottery from Avery Ranch (most probably classifiable as Rio Grand Glaze Paint B ware) would seem to indicate an occupation later than the radiocarbon range, perhaps a date in the range of AD 1350 to AD 1450. The three radiometric determinations from Recon John Shelter (5PE648) indicate a ceramic producing occupation between AD 446 and AD 969 (Zier and Kalasz 1991:119). Here, a lower stratum yielded carbon with a later date than one above it, an inversion that again suggests caution (Zier and Kalasz 1991:118). We will therefore view the radiometric evidence from Recon John as indicating that the ceramics from this site are older then those from Avery Ranch, a temporal order that gives at least minimal support to the sequence posited above.

By assuming that mass modeling predated coiling in the Fort Carson area we are tacitly claiming that the potter's craft was most probably derived from ceramic-producing groups to the north and east. The techniques of rim and lip construction give at least a modicum of support to this claim. As previously noted, the rim sherd sample contained four direct high-rimmed specimens of two-strap construction with minimal strap overlap, giving them a slight midpoint bulge. Two of these had been added to mass-modeled upper bodies (one from 5PE1798, the other from 5PE56) and two to coiled upper bodies (one from 5PE56, the other from 5PE333). Since site 5PE1798 contained only mass-modeled specimens, we will consider it to have been occupied earlier than those that contain both mass-modeled and coiled, or only coiled specimens. High rims of virtually identical construction and decoration, all however affixed to mass modeled bodies, have been described from Lahoff (25FR28) and Calumet Creek (25FR29) in Frontier County, Nebraska, Plains Woodland stage sites, presumably belonging to a late phase of the Keith variant dating to between AD 700 and 900. We therefore presume that the two-strap high rim from 5PE1798 was produced prior to those at 5PE56 and 5PE333, probably between AD 800 and AD 1000. We further speculate that the two strap high rims from 5PE56 and 5PE333 were produced at a somewhat later date, probably between AD 1250 and AD 1450, with those at 5PE56 produced prior to those at 5PE333. The rim sherd sample also contained three direct high-rimmed specimens of two-strap construction typically described as collared. Two of these collared rims had been added to mass-modeled upper bodies (both from 5PE56) and one to a coiled upper body (from 5PE868). Virtually identical rim construction and decorative techniques occur on specimens with mass-modeled upper bodies in sites of the Sumpter and Dubert sub-phases (ca

AD 850 to AD 1350) of the Solomon River Phase in north-central Kansas (Krause 1995:340-342). Similar rim construction techniques with virtually identical decorations have also been reported for Upper Republican phase (ca. AD 1200 to AD 1350) sites in south-central and southwestern Nebraska, again however, added to mass modeled bodies (Kivett and Metcalf 1997:94-102).

We suppose that since the potters at 5PE868 produced a greater number of mass-modeled pots than did those at 5PE56, the collared rim from 5PE868 was produced at a slightly earlier date than those from 5PE56. Both were probably produced between the 13th and 16th centuries. By claiming that mass modeling predated coiling were are also tacitly assuming that the coiled high rims from 5PE868 and 5PE56 were derived from the slightly earlier practice of two-strap rim construction found at 5PE1798. In sum, we are speculating that ceramic manufacture in the Fort Carson area spanned the years between the 9th and 16th centuries and that mass modeling predated coiling.

Carbonized food remains adhering to the interior upper surfaces of pottery vessels, three samples from 5PE868, one from 5PE648, and two from 5PE56 were submitted to the Interdisciplinary Archaeological Studies program at the University of Minnesota for Phytolith Analysis. Phytolith assemblages statistically similar to corn cob chaff were recovered. With the caveat that potential wild grains should be eliminated, four of the six samples contained phytolith assemblages produced by corn (Thompson and Lusteck 2000:14). A cluster analysis of the food residue results with comparative material currently available indicated the closest relationship of the Colorado specimens was with those from the small, fortified Shea site in North Dakota dated to about AD 1450 and with Dakota Flint grown in experimental gardens by Fred Schneider. Two of the Colorado samples came from 5PE56, and one each from 5PE868 and 5PE648. All the samples contained some biogenic silica, and all contained wood ash. The wood ash, from both deciduous and coniferous trees, was most probably an incidental inclusion derived from the cooking fire (Tenneson 2000:13). It is interesting, and perhaps significant to note that food residues were confined to those sites having a mixture of mass-modeled and coiled wares, with coiling being the predominant body-forming technique.

By assuming that mass modeling preceded coiling and was most probably introduced from the north and east, we are also assuming that coiling most probably entered the Fort Carson area later from the south and west. We have made our assumptions based on two presumed facts. First, mass modeling was the predominate body forming technique from the 4th to the 19th centuries in the central and western Great Plains. Second, coiling was the predominate body-forming technique in the

southwestern U.S from the time of Christ until the present. If we are correct, ceramic production was introduced to the Fort Carson area via the Turkey Creek canyon where it was represented by a minority (i.e., 11%) of the ceramic-bearing sites. Mass modeling was gradually replaced by coiling in the Turkey Creek canyon and adjacent areas (represented by 18.5% of the ceramic-bearing sites), and later was completely replaced in Turkey Creek Canyon and areas to the south where coiling was the sole manufacturing technique in the majority of sites (68.4%). We could, however, have the sequence backward, i.e.; coiling might have preceded mass modeling. Then too, mass modeling may have been introduced to the Fort Carson area from the north and east at about the same time that coiling was introduced from the south and west. These alternatives, however, seem less than satisfactory because the Fort Carson area vessel shapes and decorative techniques clearly reflect Plains Woodland stage forms and decorations rather than those in evidence to the south and west. There are corrugated specimens resembling southwestern wares in the sample drawn from 5PE868, but they are a distinct minority and come from a site whose artisans manufactured both coiled and mass-modeled wares. To judge by both clay body composition and temper, the corrugated specimens from 5PE868 were locally made copies of wares produced in far greater numbers to the south and west.

In concluding, we should like to note that the foregoing discussion may be construed as a model that can be used to further explore the significance of ceramic-bearing sites in the Fort Carson area. By a model we mean a set of empirical claims that describe the entities of import and specify their mode or modes of relatedness. By empirical we mean refutable. We have identified the entities of importance as coiled and mass-modeled lower and upper body construction, two-strap and coiled high rim manufacture, and low coiled rim manufacture. We have specified the relationship among these entities as being one of antecedence and consequence with mass-modeled lower and upper body construction preceding coiled lower and upper body construction and two-strap high rim production preceding two-strap collared, or coiled high and coiled low rim construction. Our model is refutable in that the posited antecedent and consequent relations may be tested against independently derived means of ordering the sites that yield the specified entities, namely through radiometric, archaeomagnetic, or perhaps dendrochronological determinations.

We realize that our model has many shortcomings, one of them being the limited size of the samples at our disposal. For example, of the 6 sites that yielded only mass-modeled wares, 3 of them (namely 5PE336, 5PE1748, and 5PE883) were represented by 6 specimens each, while 5PE833 yielded only 3 specimens, 5EP1213 only 2, and 5PE162 was represented by a single sherd. The sample sizes for those sites with both coiled and mass-modeled wares were larger. Site 5PE868 was

represented by 179 specimens, 5PE56 by 162, 5FN503 by 40, 5EP1192 by 38, 5PE648 by 37, 5EP143 by 20, 5EP1080 by 13, 5PE623 by 6, 5EP149 by 3, and 5PE60 by 2 sherds. Of the 34 sites containing only coiled pottery, 12 were represented by a single sherd, 5 by 2 sherds, 6 by 3 sherds, 3 by 6 sherds, 1 by 7 sherds, 1 by 9 sherds, 2 by 11 sherds, 1 by 12 sherds, 1 by 26 sherds, and 1 by 44 sherds. The small samples from sites that have thus far yielded only coiled or only mass-modeled specimens should make them prime candidates for excavations designed to refute or at least modify the model we have constructed.

Then too, given the small size of the specimens available to us, the analytical techniques at our command (i.e., visual inspection aided by illuminated magnification) are tedious and more error prone than we should like. We therefore suggest that attention be given to developing new procedures for determining if small specimens were coiled or mass modeled. Trinkley has used radiographic techniques to chart the distribution of fiber in the clay body of fiber-tempered sherds and has used this evidence to infer the practice of coiling in pottery fragments lacking clear coil breaks (Trinkley 1986:334). A similar approach might, for example, be profitably used in the analysis of the small specimens that seem to characterize so many of the ceramic samples from Colorado. As new analytical procedures are developed and additional ceramic samples are obtained, we hope that by focusing attention on ceramic production techniques our approach may serve as a guide for future research. We therefore urge the accumulation of additional ceramic samples and datable materials from sites containing only mass-modeled wares, and those containing only coiled specimens. When these are available, we should be able to make more substantial evidence-backed claims about the priority of mass modeling viz-a-viz coiling. Until then, we sincerely hope that even if we are dead wrong, our colleagues will learn something of value from our efforts.

LITERATURE CITED

Casson, Michael

1979 *The Craft of the Potter*. First U.S. edition. Barron's Educational Series, Woodbury, New York.

Funk, Robert E.

1978 The Northeastern United States. In *Ancient North Americans,* edited by Jesse D. Jennings. W. H. Freeman and Company, San Francisco.

Griffin, James B.
1978 The Midlands. In *Ancient North Americans*, edited by Jesse D. Jennings. W. H. Freeman and Company, San Francisco.

Jenkins, Ned J., and Richard A. Krause
1986 *The Tombigbee Watershed in Southeastern Prehistory*. The University Of Alabama Press, Tuscaloosa.

Kivett, Marvin F., and George S. Metcalf
1997 The Prehistoric People of the Medicine Creek Reservoir, Frontier County, Nebraska: An Experiment in Mechanized Archaeology (1946-1948). *Plains Anthropologist, Memoir 30*, 42(162).

Krause, Richard A.
1984 Modelling the Making of Pots: An Ethnoarchaeological Approach. In *The Many Dimensions of Pottery: Ceramics in Archaeology and Anthropology*, edited by S. E. van der Leeuw and A. C. Prichard. Albert Egges van Giffen Instituut voor Prae-En Protohistorie, Cingula VII, Universiteit van Amsterdam, Amsterdam, Netherlands.

1985 *The Clay Sleeps: An Ethnoarchaeological Study of Three African Potters.* The University of Alabama Press, Tuscaloosa.

1994 Paper Sacks, Paste-Board Boxes and Intellectual Bins: The River Basin Salvage. Program and Archaeological Classification. In *40 Something: The River Basin Surveys,* edited by Kimball Banks. *North Dakota Archaeology* 5:27-38.

1995 Attributes, Modes and 10th Century Potting Practices in Northcentral Kansas. *Plains Anthropologist* 40(154):307-352.

1997 Pottery Manufacture. In *Encyclopedia of Precolonial Africa: Archaeology, History, Languages, Cultures, and Environments* edited by Joseph O. Vogel. AltaMira Press, London.

Lehmer, Donald J.
1971 *Introduction of Middle Missouri Archeology.* Anthropological Papers 1. National Park Service, Washington, D.C.

Rouse, Irving B.
1962 Southwestern Archaeology Today. In *An Introduction to the Study of Southwestern Archaeology,* edited by Alfred Vincent Kidder. Yale University Press, New Haven.

Sassman, Kenneth E.
1993 *Early Pottery in the Southeast: Tradition and Innovation in CookingTechnology.* The University of Alabama Press, Tuscaloosa.

Tenneson, D.
2000 Personal communication to Richard Krause.

Thompson, Robert G and Rob Lusteck
2000 Phytolith Analysis of Food Residues in Selected Colorado Ceramics. Report on file, Department of Anthropology, The University of Alabama, Tuscaloosa.

Trinkley, Michael B., ed.
1986 *Indian and Freedman Occupation at the Fish Haul Site (38BU805), Baufort County, South Carolina.* Research Series 7. Chicora Foundation, Columbia, South Carolina.

Wedel, Waldo R.
1959 *An Introduction to Kansas Archeology.* Bulletin 174 Smithsonian Institution, Bureau of American Ethnology, Washington, D.C.

Zier, Christian J., S. Kalasz, M. Van Ness, A. Peebles and E. Anderson
1990 The Avery Ranch Site Revisited. *Plains Anthropologist* 35(128):147-174.

Zier, Christian J., and Stephen M. Kalasz
1991 Recon John Shelter and the Archaic-Woodland Transition in Southeastern Colorado. *Plains Anthropologist* 36(135):111-138.

AN INVENTORY OF CERAMICS FROM SITES ON THE FORT CARSON MILITARY BASE IN PUEBLO EL PASO, AND FREMONT COUNTIES, COLORADO

ABBREVIATIONS:

A = COILED, FLOATED, AND VERTICALLY IMPRESSED WITH A CORD-WRAPPED PADDLE

B = MASS-MODELED, SMOOTHED, AND VERTICALLY IMPRESSED WITH A CORD-WRAPPED PADDLE

Ci OR Cm = VERTICALLY IMPRESSED WITH A CORD-WRAPPED PADDLE WHEN USED IN THE DESCRIPTION OF BASE, RIM, OR LIP SHERDS

Inc = INCISED IN THE DESCRIPTION OF LIP, NEAR LIP, OR RIM SHERDS

FORT CARSON MILITARY BASE
CERAMIC-BEARING SITES IN PUEBLO COUNTY, COLORADO

5PE8
5PE56
5PE60
5PE63
5PE165
5PE323
5PE326
5PE328
5PE333
5PE336
5PE338
5PE623
5PE639
5PE648
5PE649
5PE833
5PE868
5PE883
5PE896
5PE897
5PE904
5PE910
5PE915
5PE919
5PE925
5PE965
5PE1047
5PE1798
5PE1861

5PE8.109a	Lower Body	A	2.4Lx2.8Wx1.0Th	Local + grit	
5PE56.100a-1	Upper Body	A	1.7Lx2.0Wx0.5Th	Local + grit	
5PE56.100a-1	Upper Body	A	2.3Lx2.1Wx0.5Th	Local + grit	
5PE56.102a-1	Lower Body	A	2.4Lx4.3Wx0.9Th	Local + grit	
5PE56.102a-2	Upper Body	A	2.4Lx2.4Wx0.8Th	Local + grit	
5PE56.102a-3	Upper Body	A	2.5Lx2.5Wx0.6Th	Local + grit	
5PE56.102a-4	**********	A	0.9Lx0.8Wx0.5Th	Local + grit	
5PE56.102a-5	(2)**********	*	********************	Local + grit	
5PE56.102a-5	Lower Body	A	2.2Lx1.8Wx0.7Th	Local + grit	
5PE56.102a-5	Lower Body	A	1.9Lx1.7Wx0.7Th	Local + grit	
5PE56.102a-5	Upper Body	A	1.8Lx1.5Wx0.6Th	Local + grit	
5PE56.102a-5	Upper Body	A	1.3Lx1.8Wx0.6Th	Local + grit	
5PE56.102a-6	Upper Body	A	1.9Lx1.7Wx0.6Th	Local + grit	
5PE56.102a-6	Upper Body	A	1.7Lx1.9Wx0.5Th	Local + grit	w/food adh
5RE56.102a-7	(10)********	*	********************	Local + grit	
5PE56.102a-7	Lower Body	A	2.3Lx1.6Wx0.9Th	Local + grit	
5PE56.102a-7	Upper Body	A	2.1Lx1.7Wx0.6Th	Local + grit	
5PE56.102a-7	Upper Body	A	1.9Lx1.3Wx0.6Th	Local + grit	
5PE56.102a-7	Upper Body	A	2.1Lx1.2Wx0.7Th	Local + grit	
5PE56.109a1-2	(1)**********	*	********************	Local + grit	
5PE56.109a-3	Base	Smooth Ext&Int	1.7Lx1.6Wx1.0Th	Local + grit	
5PE56.109a-4	(2)***********	*	*********************	Local + grit	
5PE56.110a-1	Upper Body	A	2.0Lx1.3Wx0.6Th	Local + grit	
5PE56.113a-1	(1)**********	*	*********************	Local + grit	
5PE56.119a-1	Upper Body	A	1.2Lx1.1Wx0.5Th	Local + grit	
5PE56.120a-1	Upper Body	B	1.2Lx0.8Wx0.5Th	Local + grit	
5PE56.120a-2	(1)**********	*	********************	Local + grit	
5PE56.121a-1	(1)*********	*	********************	Local + grit	
5PE56.121a-2	(1)**********	*	*******************	Local + grit	
5PE56.125a-1	Lower Body	A	2.3Lx1.6Wx0.7Th	Local + grit	
5PE56.125a-1	Upper Body	A	1.8Lx1.5Wx0.6Th	Local + grit	
5PE56.125a-2	Base	Smooth Int	3.8Lx2.7Wx1.1Th	Local + grit	cd imp ext
5PE56.125a-3	Upper Body	B	2.0Lx2.0Wx0.4Th	Local + grit	
5PE56.125a-s	(1)**********	*	********************	Local + grit	
5PE56.125g	Lower Body	B	1.8Lx1.9Wx0.7Th	Local + grit	
5PE56.130a-l	Base	Smooth Ext&Int	1.2Lx1.1Wx0.8Th	Local + grit	
5PE56.153a-1	Base	Smooth Ext&Int	1.3Lx0.9Wx0.9Th	Local + grit	
5PE56.153a-1	Base	Smooth Ext&Int	1.1Lx0.9Wx0.9Th	Local + grit	
5PE56.15c	Lower Body	A	4.4Lx3.4Wx0.9Th	Local + grit	
5PE56.15c	Upper Body	A	2.3Lx2.2Wx0.6Th	Local + grit	
5PE56.15c	Upper Body	A	1.5Lx1.7Wx0.6Th	Local + grit	
5PE56.16e	Upper Body	B	1.5Lx1.5Wx0.3Th	Local + grit	
5PE56.16e	Lower Body	A	1.3Lx1.4Wx0.7Th	Local + grit	
5PE56.17r	Lower Body	A	2.8Lx3.0Wx0.9Th	Local + grit	
5PE56.17s	Lower Body	A	2.9Lx2.8Wx0.9Th	Local + grit	

5PE56.17s	Lower Body	A	1.5Lx1.9Wx0.8Th	Local + grit	
5PE56.17s	Base	Smooth Ext&Int	2.5Lx1.3Wx0.9Th	Local + grit	
5PE56.17t	Base	Smooth Int	2.5Lx2.1Wx1.1Th	Local + grit	cd imp ext
5PE56.17u	Lower Body	A	2.6Lx2.3Wx0.8Th	Local + grit	
5PE56.17u	Lower Body	A	1.8Lx1.8Wx0.9Th	Local + grit	
5PE56.17u	Lower Body	A	1.4Lx2.8Wx0.9Th	Local + grit	
5PE56.17u	Lower Body	A	2.1Lx2.0Wx1.0Th	Local + grit	
5PE56.17u	Lower Body	A	1.6Lx1.1Wx0.8Th	Local + grit	
5PE56.17u	Lower Body	A	1.5Lx1.7Wx0.7Th	Local + grit	
5PE56.17u	Upper Body	A	1.5Lx2.1Wx0.6Th	Local + grit	
5PE56.17u	Upper Body	A	1.9Lx2.9Wx0.7Th	Local + grit	
5PE56.17u	Upper Body	A	2.1Lx1.6Wx0.6Th	Local + grit	
5PE56.17u	Upper Body	A	1.5Lx2.2Wx0.7Th	Local + grit	
5PE56.17u	Upper Body	A	1.5Lx1.7Wx0.7Th	Local + grit	
5PE56.17u	Base	Smooth Ext&Int	2.1Lx1.5Wx1.0Th	Local + grit	
5PE56.17u	Base	Smooth Ext&Int	3.3Lx3.2Wx1.0Th	Local + grit	
5PE56.17u	Base	Smooth Ext&Int	2.0Lx1.8Wx1.0Th	Local + grit	
5PE56.17u	(8)*********	*	********************	Local + grit	
5PE56.17v	Upper Body	B	2.1Lx2.0Wx0.5Th	Local + grit	
5PE56.17v	Upper Body	B	2.0Lx1.9Wx0.5Th	Local + grit	
5PE56.17y-1	Upper Body	A	3.5Lx3.4Wx0.8Th	Local + grit	
5PE56.17y-10	Spall	A	1.9Lx1.1Wx0.2Th	Local + grit	
5PE56.17y-11	Base	Smooth Ext&Int	1.0Lx1.0Wx1.0Th	Local + grit	
5PE56.17y-13	Spall	*	1.2Lx1.0Wx0.3Th	Local + grit	
5PE56.17y-13	(1)***********	*	********************	Local + grit	
5PE56.17y-14	(1)***********	*	********************	Local + grit	
5PE56.17y-15	Base	Smooth Ext&Int	2.7Lx2.1Wx1.0Th	Local + grit	
5PE56.17y-16	Base	Smooth Ext&Int	1.7Lx1.0Wx0.8Th	Local + grit	
5PE56.17y-17	(1)**********	*	********************	Local + grit	
5PE56.17y-18	Upper Body	A	1.3Lx1.0Wx0.5Th	Local + grit	
5PE56.17y-19	(1)**********	*	*********************	Local + grit	
5PE56.17y-2	Upper Body	A	3.2Lx3.1Wx0.6Th	Local + grit	
5PE56.17y-20	(1)**********	*	*********************	Local + grit	
5PE56.17y-21	(1)**********	*	********************	Local + grit	
5PE56.17y-23	Lower Body	A	5.1Lx4.3Wx0.8Th	Local + grit	
5PE56.17y-26	Upper Body	A	2.5Lx1.6Wx0.6Th	Local + grit	
5PE56.17y-27	Upper Body	A	1.8Lx1.7Wx0.6Th	Local + grit	
5PE56.17y-28	Upper Body	A	1.1Lx1.0Wx0.6Th	Local + grit	
5PE56.17y-29	Lower Body	A	2.2Lx1.9Wx0.8Th	Local + grit	
5PE56.17y-3	Base	Smooth Ext&Int	2.8Lx1.7Wx1.1Th	Local + grit	
5PE56.17y-30	Upper Body	A	1.8Lx1.5Wx0.6Th	Local + grit	
5PE56.17y-31	Lower Body	A	2.2Lx1.5Wx0.7Th	Local + grit	
5PE56.17y-32	Upper Body	A	1.7Lx1.5Wx0.6Th	Local + grit	
5PE56.17y-33	Upper Body	A	1.6Lx1.1Wx0.6Th	Local + grit	
5PE56.17y-34	Upper Body	A	2.0Lx1.3Wx0.6Th	Local + grit	

5PE56.17y-35	Upper Body	A	1.9Lx1.4Wx0.6Th	Local + grit		
5PE56.17y-36	Upper Body	A	1.3Lx1.4Wx0.6Th	Local + grit		
5PE56.17y-37	Upper Body	A	2.8Lx2.0Wx0.6Th	Local + grit		
5PE56.17y-38	Lower Body	A	2.5Lx1.5Wx0.8Th	Local + grit		
5PE56.17y-39	Upper Body	A	0.8Lx1.3Wx0.6Th	Local + grit		
5PE56.17y-4	Base	Smooth Ext&Int	1.8Lx1.6Wx1.1Th	Local + grit		
5PE56.17y-40	Upper Body	A	1.3Lx1.0Wx0.6Th	Local + grit		
5PE56.17y-41	(1)*********	*	********************	Local + grit		
5PE56.17y-42	Lower Body	A	1.4Lx0.8Wx0.8Th	Local + grit		
5PE56.17y-44	Upper Body	B	1.7Lx1.2Wx0.5Th	Local + grit		
5PE56.17y-45	Upper Body	B	2.8Lx1.9Wx0.5Th	Local + grit		
5PE56.17y-46	Upper Body	A	2.6Lx1.6Wx0.7Th	Local + grit		
5PE56.17y-47	Upper Body	B	1.2Lx1.2Wx0.5Th	Local + grit		
5PE56.17y-48	Upper Body	Smooth Ext&Int	2.1Lx2.1Wx1.0Th	Non Local	n/l manuf	n/l clay
5PE56.17y-49	Upper Body	B	1.8Lx1.4Wx0.5Th	Local + grit		
5PE56.17y-5	Base	Smooth Ext&Int	1.6Lx1.5Wx1.0Th	Local + grit		
5PE56.17y-50	Upper Body	A	1.5Lx1.5Wx0.6Th	Local + grit		
5PE56.17y-51	Upper Body	A	1.2Lx1.5Wx0.6Th	Local + grit		
5PE56.17y-52	Upper Body	A	1.1Lx1.0Wx0.4Th	Local + grit		
5PE56.17y-53	Base	Smooth Ext&Int	2.1Lx1.8Wx1.1Th	Local + grit		
5PE56.17y-54	Base	Smooth Ext&Int	1.6Lx1.4Wx1.0Th	Local + grit		
5PE56.17y-6	Base	Smooth Ext&Int	1.6Lx1.1Wx1.0Th	Local + grit		
5PE56.17y-7	Base	Smooth Ext&Int	2.7Lx1.6Wx0.9Th	Local + grit		
5PE56.17y-8	Base	Smooth Ext&Int	1.5Lx1.0Wx0.9Th	Local + grit		
5PE56.17y-9	Base	Smooth Ext&Int	1.0Lx1.0Wx0.8Th	Local + grit		
5PE56.18g	Base	Smooth Ext&Int	2.7Lx2.2Wx1.0Th	Local + grit		
5PE56.18g	Lower Body	A	1.4Lx1.1Wx0.7Th	Local + grit		
5PE56.19d	Upper Body	A	2.4Lx2.5Wx0.5Th	Local + grit		
5PE56.1l	Upper Body	A	3.0Lx1.7Wx0.6Th	Local + grit		
5PE56.1l	Lower Body	A	2.9Lx2.0Wx0.7Th	Local + grit		
5PE56.21c	Upper Body	A	1.4Lx1.4Wx0.7Th	Local + grit		
5PE56.21c	Lower Body	A	2.2Lx1.7Wx0.9Th	Local + grit		
5PE56.21c	(1)**********	*	********************	Local + grit		
5PE56.229	Base	Smooth Ext&Int	2.0Lx1.4Wx1.1Th	Local + grit		
5PE56.229	Base	Smooth Int	2.2Lx1.5Wx1.0Th	Local + grit	cd imp ext	
5PE56.229	Base	Smooth Ext&Int	1.3Lx0.9Wx0.9Th	Local + grit		
5PE56.229	(1)********	*	********************	Local + grit		
5PE56.229	Upper Body	A	1.4Lx1.8Wx0.5Th	Local + grit		
5PE56.229	Upper Body	A	1.2Lx1.5Wx0.4Th	Local + grit		
5PE56.229	Lower Body	A	1.2Lx1.3Wx0.7Th	Local + grit		
5PE56.229	Lower Body	A	0.8Lx1.3Wx0.7Th	Local + grit		

5PE56.23d	(1)**********	*	*********************	Local + grit	
5PE56.25d	Upper Body	B	3.3Lx3.8Wx0.5Th	Local + grit	
5PE56.31b	Lower Body	A	2.1Lx1.9Wx0.7Th	Local + grit	
5PE56.31b	Lower Body	A	1.8Lx2.3Wx0.8Th	Local + grit	
5PE56.31b	Upper Body	A	2.3Lx1.8Wx0.6Th	Local + grit	
5PE56.31b	Upper Body	A	1.0Lx1.5Wx0.5Th	Local + grit	
5PE56.39a-1	Lower Body	A	1.9Lx2.1Wx0.6Th	Local + grit	
5PE56.39a-2	Upper Body	B	2.0Lx2.1Wx0.5Th	Local + grit	
5PE56.44a-1	Upper Body	A	1.4Lx1.2Wx0.5Th	Local + grit	
5PE56.44a-2	Lower Body	A	2.6Lx2.5Wx0.9Th	Local + grit	
5PE56.49a-1	Upper Body	A	1.6Lx2.1Wx0.7Th	Local + grit	
5PE56.49a-2	Upper Body	B	1.8Lx1.1Wx0.5Th	Local + grit	
5PE56.49a-3	Upper Body	B	1.7Lx1.1Wx0.4Th	Local + grit	
5PE56.49a-4	Upper Body	A	1.5Lx1.3Wx0.5Th	Local + grit	
5PE56.51a	Lower Body	A	2.8Lx2.5Wx0.9Th	Local + grit	
5PE56.51a2	(1)**********	*	*********************	Local + grit	
5PE56.51a3	Upper Body	B	2.0Lx2.1Wx0.4Th	Local + grit	
5PE56.53a	Base	Smooth Int	1.8Lx1.6Wx0.8Th	Local + grit	cd imp ext
5PE56.53a-1	Upper Body	A	1.7Lx1.4Wx0.6Th	Local + grit	
5PE56.53a-2	Upper Body	A	1.8Lx1.6Wx0.6Th	Local + grit	
5PE56.53a-2	Upper Body	A	1.3Lx1.5Wx0.5Th	Local + grit	
5PE56.54a-1	Upper Body	A	2.1Lx2.5Wx0.5Th	Local + grit	
5PE56.54a-2	Upper Body	B	2.0Lx1.1Wx0.5Th	Local + grit	
5PE56.57a-1	Upper Body	A	2.0Lx2.7Wx0.6Th	Local + grit	
5PE56.59a-1	Upper Body	A	0.7Lx1.2Wx0.6Th	Local + grit	Coil
5PE56.5b	Lower Body	B	2.3Lx2.1Wx0.7Th	Local + grit	
5PE56.5b	Base	Smooth Ext&Int	1.7Lx1.5Wx0.8Th	Local + grit	
5PE56.6	Upper Body	A	1.5Lx1.5Wx0.6Th	Local + grit	
5PE56.61a-1	Upper Body	A	0.5Lx0.7Wx0.5Th	Local + grit	
5PE56.61a-2	Upper Body	A	4.7Lx4.0Wx0.6Th	Local + grit	□+shdlr□
5PE56.63a-1	Upper Body	B	1.1Lx1.2Wx0.4Th	Local + grit	
5PE56.64a-1	Lower Body	A	2.8Lx2.5Wx0.8Th	Local + grit	
5PE56.65a-1	Base	Smooth Ext&Int	1.6Lx1.6Wx0.8Th	Local + grit	
5PE56.65a-2	Base	Smooth Ext&Int	1.4Lx1.0Wx0.8Th	Local + grit	
5PE56.70a-1	Upper Body	A	2.7Lx3.6Wx0.5Th	Local + grit	
5PE56.70a-1	Upper Body	A	2.6Lx3.6Wx0.6Th	Local + grit	w/food adh
5PE56.71a-1	Base	Smooth Ext&Int	1.2Lx1.0Wx0.8Th	Local + grit	
5PE56.73a-1	(4)***********	*	********************	Local + grit	
5PE56.74a-1	Upper Body	B	1.9Lx2.6Wx0.4Th	Local + grit	
5PE56.76a-1	Base	Smooth Ext&Int	3.0Lx2.5Wx1.1Th	Local + grit	
5PE56.77a-1	Base	Smooth Int	4.5Lx4.5Wx0.9Th	Local + grit	cd imp ext
5PE56.81a-1	Lower Body	A	2.0Lx1.9Wx0.7Th	Local + grit	
5PE56.81a-2	Upper Body	B	2.8Lx2.5Wx0.5Th	Local + grit	
5PE56.81a-3	Upper Body	A	0.9Lx0.9Wx0.5Th	Local + grit	
5PE56.85a-2	Base	Smooth Ext&Int	2.4Lx1.6Wx0.9Th	Local + grit	
5PE56.85a-2	Upper Body	A	1.1Lx1.0Wx0.5Th	Local + grit	

5PE56.88a-1	Upper Body	A	1.9Lx1.9Wx0.8Th	Local + grit
5PE56.88a-3	Upper Body	A	3.2Lx2.2Wx0.8Th	Local + grit
5PE56.91a-1	Lower Body	A	2.2Lx3.0Wx0.8Th	Local + grit
5PE56.91a-1	Lower Body	A	2.0Lx3.0Wx0.8Th	Local + grit
5PE56.93a-1	Upper Body	A	1.5Lx1.0Wx0.8Th	Local + grit
5PE56.98a-1	Lower Body	A	4.2Lx3.7Wx0.8Th	Local + grit
5PE56.99a-5	Upper Body	A	3.1Lx3.7Wx0.7Th	Local + grit
5PE56a-1	Upper Body	A	1.5Lx1.2Wx0.6Th	Local + grit
5PE56a-2	Upper Body	A	2.0Lx1.5Wx0.5Th	Local + grit
5PE56a-3	Upper Body	A	1.7Lx1.1Wx0.5Th	Local + grit
5PE56a-4	Upper Body	A	1.4Lx1.3Wx0.5Th	Local + grit
5PE56a-5	Upper Body	A	0.7Lx1.3Wx0.5Th	Local + grit
5PE60.2f	Upper Body	A	2.5Lx3.0Wx0.6Th	Local + grit
5PE60.3a	Upper Body	B	2.5Lx1.6Wx0.4Th	Local + grit
5PE63.18a	Lower Body	A	2.9Lx2.6Wx0.7Th	Local + grit
5PE63.47a	Upper Body	A	2.4Lx2.3Wx0.7Th	Local + grit
5PE165.0.27	Lower Body	A	1.0Lx1.1Wx0.7Th	Local + grit
5PE323.10a	Lower Body	A	1.7Lx2.2Wx0.8Th	Local + grit
5PE323.11a	Upper Body	A	2.3Lx3.4Wx0.7Th	Local + grit
5PE323.9a	(1)**********	*	********************	Local + grit
5PE326	Upper Body	A	2.0Lx2.0Wx0.5Th	Local + grit
5PE326.100a	Base	Smooth Ext&Int	9.0Lx9.0Wx0.9Th	Local + grit
5PE326.102a	Upper Body	A	1.9Lx1.5Wx0.6Th	Local + grit
5PE326.103a	(1)**********	*	*********************	Local + grit
5PE326.104a	Lower Body	A	1.8Lx1.9Wx0.8Th	Local + grit
5PE326.105a	Upper Body	A	2.1Lx1.6Wx0.6Th	Local + grit
5PE326.106a	Lower Body	A	1.4Lx2.2Wx0.7Th	Local + grit
5PE326.108a	Base	Smooth Ext&Int	2.2Lx1.5Wx0.8Th	Local + grit
5PE326.109a	Upper Body	A	1.1Lx1.7Wx0.6Th	Local + grit
5PE326.110a	Lower Body	A	2.4Lx1.9Wx0.9Th	Local + grit
5PE326.111a	Lower Body	A	1.8Lx1.2Wx0.8Th	Local + grit
5PE326.111a	Upper Body	A	1.0Lx1.5Wx0.6Th	Local + grit
5PE326.113a	Base	Smooth Ext&Int	1.8Lx1.6Wx0.7Th	Local + grit
5PE326.114a	(1)**********	*	*********************	Local + grit
5PE326.115a	(1)**********	*	*********************	Local + grit
5PE326.116a	(1)**********	*	*********************	Local + grit
5PE326.117a	Lower Body	A	2.2Lx2.5Wx0.8Th	Local + grit
5PE326.118a	Base	Smooth Ext&Int	1.8Lx1.6Wx0.8Th	Local + grit
5PE326.119a	Upper Body	A	1.6Lx1.7Wx0.7Th	Local + grit
5PE326.120a	Upper Body	A	1.8Lx1.8Wx0.6Th	Local + grit
5PE326.121a	Upper Body	A	1.4Lx2.0Wx0.6Th	Local + grit
5PE326.122a	Upper Body	A	2.4Lx3.8Wx0.6Th	Local + grit
5PE326.128a	Lower Body	A	2.0Lx2.8Wx0.8Th	Local + grit
5PE326.134a	Base	Smooth	2.5Lx2.0Wx0.9Th	Local + grit

5PE326.199	Lower Body	Ext&Int A	2.1Lx1.6Wx0.7Th	Local + grit
5PE326.312	Lower Body	A	1.5Lx1.0Wx0.8Th	Local + grit
5PE326.95a	Base	Smooth	1.4Lx1.1Wx0.8Th	Local + grit
5PE326.96a	Lower Body	Ext&Int A	1.1Lx1.3Wx0.7Th	Local + grit
5PE326.97a	Lower Body	A	2.8Lx2.4Wx0.8Th	Local + grit
5PE326.98a	Upper Body	A	2.2Lx2.2Wx0.6Th	Local + grit
5PE326.99a	(1)**********	*	*********************	Local + grit
5PE328.181	Upper Body	A	1.6Lx1.5Wx0.6Th	Local + grit
5PE328.34a	(1)*********	*	*********************	Local + grit
5PE328.35a	Lower Body	A	1.1Lx1.1Wx0.7Th	Local + grit
5PE328.36a	Upper Body	A	2.6Lx1.5Wx0.6Th	Local + grit
5PE328.37a	(1)**********	*	*********************	Local + grit
5PE328.39a	(1)**********	*	*********************	Local + grit
5PE328.40a	(1)**********	*	*********************	Local + grit
5PE328.41a	(1)*********	*	*********************	Local + grit
5PE333.30a	Lower Body	A	1.7Lx1.8Wx0.8Th	Local + grit
5PE333.30a	Lower Body	A	1.4Lx2.4Wx0.6Th	Local + grit
5PE333.30a	Lower Body	A	2.3Lx2.1Wx0.8Th	Local + grit
5PE333.30a	Lower Body	A	2.3Lx3.4Wx0.8Th	Local + grit
5PE333.30a	Lower Body	A	3.1Lx3.6Wx0.7Th	Local + grit
5PE333.30a	Lower Body	A	4.1Lx4.4Wx0.7Th	Local + grit
5PE333.30a	Lower Body	A	2.1Lx2.5Wx0.7Th	Local + grit
5PE333.30a	Lower Body	A	2.5Lx1.5Wx0.7Th	Local + grit
5PE333.30a	Lower Body	A	1.5Lx2.2Wx0.7Th	Local + grit
5PE333.30a	Lower Body	A	2.3Lx1.5Wx0.8Th	Local + grit
5PE333.30a	Lower Body	A	2.1Lx2.7Wx0.7Th	Local + grit
5PE333.30a	Lower Body	A	2.3Lx1.7Wx0.7Th	Local + grit
5PE333.30a	Lower Body	A	2.0Lx2.1Wx0.7Th	Local + grit
5PE333.30a	Lower Body	A	1.5Lx2.5Wx0.7Th	Local + grit
5PE333.30a	Lower Body	A	1.8Lx1.5Wx0.8Th	Local + grit
5PE333.30a	Lower Body	A	1.5Lx2.3Wx0.7Th	Local + grit
5PE333.30a	Lower Body	A	1.2Lx1.4Wx0.8Th	Local + grit
5PE333.30a	Lower Body	A	1.4Lx1.8Wx0.8Th	Local + grit
5PE333.30a	Lower Body	A	1.2Lx1.8Wx0.7Th	Local + grit
5PE333.30a	Lower Body	A	1.2Lx1.5Wx0.7Th	Local + grit
5PE333.30a	Lower Body	A	1.8Lx1.5Wx0.7Th	Local + grit
5PE333.30a	Lower Body	A	1.2Lx1.6Wx0.7Th	Local + grit
5PE333.30a	Lower Body	A	1.4Lx1.3Wx0.7Th	Local + grit
5PE333.30a	(5)**********	*	*********************	Local + grit
5PE333.30a	Upper Body	A	2.3Lx2.0Wx0.6Th	Local + grit
5PE333.30a	Upper Body	A	2.8Lx2.9Wx0.6Th	Local + grit
5PE333.30a	Upper Body	A	2.7Lx1.5Wx0.7Th	Local + grit
5PE333.30a	Upper Body	A	2.8Lx1.9Wx0.6Th	Local + grit
5PE333.30a	Upper Body	A	1.4Lx2.1Wx0.6Th	Local + grit
5PE333.30a	Upper Body	A	1.1Lx2.1Wx0.6Th	Local + grit
5PE333.30a	Upper Body	A	1.1Lx1.6Wx0.7Th	Local + grit
5PE333.30a	Upper Body	A	2.0Lx2.0Wx0.6Th	Local + grit
5PE333.30a	Upper Body	A	1.7Lx1.1Wx0.5Th	Local + grit
5PE333.30a	Upper Body	A	1.5Lx1.4Wx0.5Th	Local + grit

5PE333.30a	Upper Body	A	1.0Lx1.4Wx0.4Th	Local + grit		
5PE333.30a	Upper Body	A	2.0Lx1.7Wx0.6Th	Local + grit		
5PE333.30a	Upper Body	A	1.4Lx1.0Wx0.5Th	Local + grit		
5PE333.30a	Upper Body	A	1.3Lx1.0Wx0.5Th	Local + grit		
5PE333.30a	Upper Body	A	1.7Lx1.4Wx0.5Th	Local + grit		
5PE333.30a	Base	Smooth Int	5.0Lx3.2Wx1.2Th	Local + grit	cd imp ext	
5PE333.30a	Base	Smooth Int&Ext	2.9Lx1.7Wx1.1Th	Local + grit		
5PE333.30a	Upper Body	B	4.4Lx4.0Wx0.5Th	Non Local	grit	Anvil Mark
5PE333.41a	Lower Body	A	1.7Lx3.0Wx0.8Th	Local + grit		
5PE333.41b	Upper Body	A	2.1Lx1.3Wx0.6Th	Local + grit		
5PE333.41c	Lower Body	A	1.9Lx2.0Wx0.7Th	Local + grit		
5PE333.41d	(1)**********	*	********************	Local + grit		
5PE336.104	Upper Body	B	2.2Lx2.2Wx0.4Th	Local + grit		
5PE336.2a	Upper Body	B	1.6Lx2.0Wx0.4Th	Local + grit		
5PE336.4a	Upper Body	B	1.6Lx2.5Wx0.4Th	Local + grit		
5PE336.5a	Upper Body	B	1.8Lx1.9Wx0.4Th	Local + grit		
5PE336.6a	Upper Body	B	1.8Lx1.2Wx0.4Th	Local + grit		
5PE336.7a	Upper Body	A	1.4Lx1.3Wx0.5Th	Local + grit		
5PE338.22a	(1)**********	*	********************	Local + grit		
5PE338.23a	Upper Body	A	2.2Lx1.5Wx0.5Th	Local + grit	Smooth	Ext&Int
5PE338.24a	Upper Body	A	2.3Lx2.5Wx0.5Th	Local + grit	Smooth	Ext&Int
5PE338.25a	Upper Body	A	2.3Lx1.5Wx0.6Th	Local + grit	Smooth	Ext&Int
5PE338.26a	(1)**********	*	********************	Local + grit		
5PE338.27a	(1)**********	*	********************	Local + grit		
5PE338.28a	(1)**********	*	********************	Local + grit		
5PE338.29a	Upper Body	A	2.3Lx2.1Wx0.5Th	Local + grit	Smooth	Ext&Int
5PE338.30a	(1)**********	*	*********************	Local + grit		
5PE338.31a	(1)*********	*	*********************	Local + grit		
5PE338.32a	Upper Body	A	1.5Lx1.1Wx0.5Th	Local + grit	Smooth	Ext&Int
5PE338.33a	(1)*********	*	********************	Local + grit		
5PE338.34a	Upper Body	A	1.5Lx1.1Wx0.6Th	Local + grit		
5PE623	Lower Body	A	3.0Lx2.9Wx0.8Th	Local + grit		
5PE623.1a	Upper Body	B	3.1Lx2.2Wx0.5Th	Local + grit		
5PE623.1a	Upper Body	B	2.3Lx1.8Wx0.5Th	Local + grit		
5PE623.1a	Upper Body	A	2.5Lx2.1Wx0.6Th	Local + grit		
5PE623.1h	Upper Body	A	3.0Lx3.7Wx0.7Th	Local + grit		
5PE623.1h	Upper Body	A	1.8Lx2.3Wx0.5Th	Local + grit		
5PE639.1d	Upper Body	A	1.3Lx2.1Wx0.6Th	Local + grit		
5PE639.1d	Upper Body	A	1.4Lx1.8Wx0.6Th	Local + grit		
5PE639.2h	Base	Smooth Int	2.1Lx2.5Wx1.0Th	Local + grit	Cm Ext	
5PE639.2h	Lower Body	A	1.7Lx1.7Wx0.8Th	Local + grit		
5PE639.2h	Lower Body	A	1.2Lx1.6Wx0.8Th	Local + grit		
5PE639.2h	Upper Body	A	1.8Lx1.3Wx0.6Th	Local + grit		
5PE639.2h	Upper Body	A	1.3Lx2.0Wx0.6Th	Local + grit		
5PE648.109a	Upper Body	A	1.2Lx1.4Wx0.6Th	Local + grit		
5PE648.114a	Upper Body	A	1.3Lx0.8Wx0.6Th	Local + grit	w/food	

					adh	
5PE648.14k	Lower Body	A	4.2Lx4.2Wx0.7Th	Local + grit	w/food adh	
5PE648.14k	Lower Body	A	1.9Lx2.5Wx0.7Th	Local + grit	w/food adh	
5PE648.14k	Lower Body	A	2.5Lx3.4Wx0.7Th	Local + grit	w/food adh	
5PE648.20e	Lower Body	A	3.8Lx3.8Wx0.7Th	Local + grit		
5PE648.20e	Upper Body	A	2.0Lx3.8Wx0.6Th	Local + grit		
5PE648.20e	Upper Body	B	1.8Lx1.5Wx0.5Th	Local + grit		
5PE648.20e	Upper Body	B	1.4Lx0.9Wx0.5Th	Local + grit		
5PE648.228a	Upper Body	B	0.9Lx0.8Wx0.5Th	Local + grit		
5PE648.228a-1	(1)**********	*	********************	Local + grit		
5PE648.267a	Base	Smooth Ext&Int	2.5Lx0.8Wx0.8Th	Local + grit		
5PE648.268a	Lower Body	A	0.8Lx0.8Wx0.7Th	Local + grit		
5PE648.268a	(1)**********	*	*********************	Local + grit		
5PE648.26a	Upper Body	A	2.8Lx1.8Wx0.5Th	Local + grit		
5PE648.26a	Upper Body	A	2.4Lx3.0Wx0.5Th	Local + grit		
5PE648.26a	Upper Body	A	2.0Lx1.7Wx0.6Th	Local + grit	inc horiz	Line
5PE648.26a	Upper Body	A	1.8Lx1.0Wx0.5Th	Local + grit	inc horiz	Line
5PE648.26a	Upper Body	A	1.6Lx2.0Wx0.6Th	Local + grit	inc horiz	Line
5PE648.26a	Lower Body	A	1.9Lx2.2Wx0.7Th	Local + grit		
5PE648.26a	Lower Body	A	2.3Lx2.2Wx0.7Th	Local + grit		
5PE648.26a	Lower Body	A	3.6Lx2.4Wx0.7Th	Local + grit		
5PE648.26a	Upper Body	A	2.1Lx1.6Wx0.5Th	Local + grit		
5PE648.26a	Lower Body	A	1.1Lx1.2Wx0.7Th	Local + grit		
5PE648.26a	Upper Body	B	1.8Lx1.4Wx0.5Th	Local + grit		
5PE648.26a	Upper Body	B	2.1Lx1.6Wx0.5Th	Local + grit		
5PE648.26a	Base	Smooth Ext&Int	2.4Lx1.8Wx1.1Th	Local + grit		
5PE648.273a	Lower Body	B	3.7Lx2.8Wx0.9Th	Local + grit		
5PE648.273a	Lower Body	B	9.0Lx1.2Wx0.7Th	Local + grit		
5PE648.29a	Upper Body	A	2.1Lx1.9Wx0.6Th	Local + grit		
5PE648.29a	Upper Body	A	0.9Lx1.2Wx0.5Th	Local + grit		
5PE648.29a	Upper Body	B	2.1Lx1.6Wx0.5Th	Local + grit		
5PE648.301a	Upper Body	A	4.3Lx3.2Wx0.6Th	Local + grit		
5PE648.318a	Lower Body	B	2.3Lx2.0Wx0.6Th	Local + grit		
5PE648.3c	Upper Body	A	0.9Lx1.3Wx0.6Th	Local + grit		
5PE648.4b	Upper Body	A	2.0Lx2.5Wx0.6Th	Local + grit		
5PE648.62a	Upper Body	A	2.8Lx2.9Wx0.6Th	Local + grit		
5PE648.9h	Upper Body	B	2.6Lx2.5Wx0.5Th	Local + grit		
5PE648.9h	Upper Body	B	1.5Lx1.4Wx0.5Th	Local + grit		
5PE649	(1)**********	*	********************	Local + grit		
5PE649.2d	Upper Body	A	1.7Lx1.6Wx0.6Th	Local + grit		
5PE649.3c	Lower Body	A	2.1Lx2.1Wx0.7Th	Local + grit		
5PE649.5k	Upper Body	A	1.7Lx1.3Wx0.6Th	Local + grit		
5PE649.6i	(1)**********	*	********************* *	Local + grit		

5PE649.7c	Lower Body	A	1.5Lx1.7Wx0.7Th	Local + grit		
5PE649.7c	Upper Body	A	11.6Lx0.5Wx0.5Th	Local + grit		
5PE649.8a	Lower Body	B	1.8Lx2.3Wx0.6Th	Local + grit		
5PE649.8g	Lower Body	A	2.0Lx1.6Wx0.6Th	Local + grit		
5PE649.8g	Base	Smooth Ext&Int	1.5Lx1.3Wx0.8Th	Local + grit		
5PE649.8g	Upper Body	A	1.4Lx1.5Wx0.6Th	Local + grit		
5PE649.8g	Upper Body	A	1.0Lx0.9Wx0.5Th	Local + grit		
5PE649.9e	Base	Smooth Ext&Int	1.5Lx1.4Wx0.8Th	Local + grit		
5PE649.9e	Base	Sm Ext&Int	2.0Lx1.1Wx0.9Th	Local + grit		
5PE833.11a	(1)**********	*	********************	Local + grit		
5PE833.2a	Upper Body	B	1.1Lx0.8Wx0.3Th	Local + grit		
5PE833.2a	(1)**********	*	********************	Local + grit		
5PE868.114a	Upper Body	A	2.2Lx2.7Wx0.6Th	Local + grit		
5PE868.114a	Upper Body	A	1.4Lx1.4Wx0.6Th	Local + grit		
5PE868.114a	Upper Body	A	2.0Lx1.6Wx0.6Th	Local + grit		
5PE868.114a	Upper Body	A	1.4Lx0.6Wx0.6Th	Local + grit		
5PE868.114a	(1)**********	*	********************	Local + grit		
5PE868.114a	(1)**********	*	********************	Local + grit		
5PE868.114a	(1)**********	*	********************	Local + grit		
5PE868.114a	(1)**********	*	********************	Local + grit		
5PE868.114a	Upper Body	A	1.4Lx1.8Wx0.6Th	Local + grit		
5PE868.114a	Upper Body	A	1.2Lx1.1Wx0.5Th	Local + grit		
5PE868.11a	Lower Body	A	2.0Lx1.8Wx0.8Th	Local + grit		
5PE868.123a	Lower Body	A	3.0Lx2.9Wx0.7Th	Local + grit		
5PE868.128a	Upper Body	A	1.6Lx1.3Wx0.6Th	Local + grit		
5PE868.12a	Spall	*	2.6Lx2.2W.0.3Th	Local + grit		
5PE868.131a	Base	Smooth Ext&Int	1.7Lx1.1Wx0.8Th	Local + grit		
5PE868.131a	Lower Body	A	1.0Lx1.0Wx0.6Th	Local + grit		
5PE868.14a	Upper Body	A	1.8Lx1.6Wx0.7Th	Local + grit	w/2 hz pl	inc lines
5PE868.14a	Upper Body	A	1.9Lx1.8Wx0.9Th	Local + grit	w/2rt agl	inc lines
5PE868.14a	Lower Body	A	4.8Lx3.1Wx0.9Th	Local + grit		
5PE868.14a	Lower Body	A	2.5Lx2.5Wx0.8Th	Local + grit		
5PE868.14a	Lower Body	B	2.0Lx3.6Wx0.7Th	Local + grit		
5PE868.14a	Upper Body	B	1.6Lx0.8Wx0.5Th	Local + grit		
5PE868.14a	Lower Body	A	1.6Lx1.1Wx0.8Th	Local + grit		
5PE868.14a	Upper Body	B	2.3Lx2.1Wx0.6Th	Local + grit		
5PE868.14a	Lower Body	A	1.9Lx1.8Wx0.8Th	Local + grit		
5PE868.14a	Lower Body	A	2.2Lx3.0Wx0.7Th	Local + grit		
5PE868.14a	Base	Smooth Ext&Int	1.8Lx1.5Wx0.8Th	Local + grit		
5PE868.14a	Base	Smooth Ext&Int	1.6Lx1.4Wx0.9Th	Local + grit		
5PE868.14a	(1)**********	*	********************	Local + grit		
5PE868.14a	Upper Body	B	1.2Lx1.6Wx0.5Th	Local + grit		
5PE868.14a	Upper Body	B	1.2Lx0.9Wx0.5Th	Local + grit		
5PE868.14a	Upper Body	B	0.9Lx1.0Wx0.4Th	Local + grit		

5PE868.14a	Upper Body	A	0.9Lx1.0Wx0.6Th	Local + grit	
5PE868.14a	(1)**********	*	********************	Local + grit	
5PE868.14a	Base	Smooth Ext&Int	1.4Lx1.1Wx0.8Th	Local + grit	
5PE868.14a	Base	Smooth Ext&Int	1.4Lx1.2Wx0.9Th	Local + grit	
5PE868.14a	Lower Body	A	1.5Lx1.4Wx0.7Th	Local + grit	
5PE868.14a	Lower Body	A	1.5Lx1.3Wx0.7Th	Local + grit	
5PE868.14a	Lower Body	B	2.0Lx1.3Wx0.6Th	Local + grit	
5PE868.14a	Lower Body	A	1.8Lx2.2Wx0.9Th	Local + grit	
5PE868.153a	Lower Body	A	2.2Lx1.8Wx0.9Th	Local + grit	
5PE868.157a	Lower Body	A	3.4Lx2.4Wx0.6Th	Local + grit	
5PE868.157a	Lower Body	A	3.0Lx3.1Wx0.8Th	Local + grit	
5PE868.157a	Upper Body	A	3.3Lx3.1Wx0.7Th	Local + grit	
5PE868.157a	Upper Body	A	2.1Lx1.7Wx0.6Th	Local + grit	
5PE868.157a	Upper Body	A	1.9Lx1.2Wx0.6Th	Local + grit	
5PE868.157a	Upper Body	B	2.5Lx2.4Wx0.5Th	Local + grit	
5PE868.157a	Upper Body	B	1.4Lx1.4Wx0.4Th	Local + grit	
5PE868.170a	Base	Smooth Ext&Int	1.2Lx1.0Wx0.9Th	Local + grit	
5PE868.173a	Upper Body	A	2.3Lx2.2Wx0.5Th	Local + grit	
5PE868.173a	Upper Body	B	1.4Lx1.3Wx0.3Th	Local + grit	
5PE868.176a	Lower Body	A	22.3Lx2.0Wx0.8Th	Local + grit	
5PE868.176a	Lower Body	A	2.1Lx1.9Wx0.7Th	Local + grit	
5PE868.176a	Lower Body	A	2.7Lx2.0Wx0.8Th	Local + grit	
5PE868.19a	Lower Body	A	2.1Lx1.7Wx0.7Th	Local + grit	
5PE868.19a	(1)**********	*	********************	Local + grit	
5PE868.204a	Upper Body	A	2.5Lx2.8Wx0.6Th	Local + grit	
5PE868.205a	(1)**********	*	********************	Local + grit	
5PE868.205a	(1)*********	*	********************	Local + grit	
5PE868.205a	Upper Body	A	2.1Lx2.2Wx0.7Th	Local + grit	
5PE868.205a	Upper Body	A	1.1Lx1.5Wx0.7Th	Local + grit	
5PE868.205a	(1)*********	*	**********************	Local + grit	
5PE868.205a	Lower Body	A	6.5Lx4.5Wx0.8Th	Local + grit	w/food adh
5PE868.218a	Lower Body	A	3.3L2.8Wx0.8Th	Local + grit	
5PE868.218a	Base	Smooth Ext&Int	2.5Lx1.5Wx0.9Th	Local + grit	
5PE868.218a	Lower Body	A	1.5Lx1.5Wx0.8Th	Local + grit	
5PE868.218a	Upper Body	B	1.5Lx1.7Wx0.5Th	Local + grit	
5PE868.218a	Upper Body	B	1.2Lx1.8Wx0.5Th	Local + grit	
5PE868.218a	(3)**********	*	********************	Local + grit	
5PE868.218a	Base	Smooth Ext&Int	2.6Lx2.0Wx1.0Th	Local + grit	
5PE868.218a	Upper Body	A	3.3Lx2.9Wx0.7Th	Local + grit	
5PE868.218a	Upper Body	A	1.5Lx1.7Wx0.6Th	Local + grit	
5PE868.218a	Lower Body	A	1.6Lx1.5Wx0.8Th	Local + grit	
5PE868.218a	Upper Body	B	1.4Lx1.4Wx0.6Th	Local + grit	
5PE868.218a	Upper Body	A	1.6Lx1.8Wx0.8Th	Local + grit	
5PE868.218a	Upper Body	A	1.8Lx2.2Wx0.7Th	Local + grit	
5PE868.218a	Upper Body	A	1.5Lx1.1Wx0.6Th	Local + grit	
5PE868.218a	Base	Smooth Ext&Int	1.7Lx1.1Wx0.8Th	Local + grit	

5PE868.218a	Upper Body	A	2.8Lx2.8Wx0.7Th	Local + grit		
5PE868.218a	Base	Smooth Ext&Int	2.7Lx2.6Wx0.9Th	Local + grit		
5PE868.218a	Upper Body	B	1.5Lx1.4Wx0.6Th	Local + grit		
5PE868.218a	Lower Body	B	2.3Lx2.1Wx0.7Th	Local + grit		
5PE868.218a	Lower Body	A	2.3Lx2.2Wx0.7Th	Local + grit		
5PE868.218a	Lower Body	A	2.8Lx2.9Wx0.7Th	Local + grit		
5PE868.218a	Base	Smooth Int	2.6Lx2.6Wx0.9Th	Local + grit	cd imp ext	
5PE868.218a	Upper Body	A	1.4Lx1.5Wx0.6Th	Local + grit		
5PE868.218a	(5)**********	*	********************	Local + grit		
5PE868.218a	Lower Body	A	3.4Lx5.0Wx0.7Th	Local + grit		
5PE868.218a	Lower Body	A	1.5Lx1.6Wx0.7Th	Local + grit		
5PE868.218a	Base	Smooth Ext&Int	2.5Lx1.9Wx0.9Th	Local + grit		
5PE868.218a	Upper Body	A	1.2Lx1.8Wx0.5Th	Local + grit		
5PE868.218a	Upper Body	A	1.4Lx1.7Wx0.5Th	Local + grit		
5PE868.218a	Lower Body	A	1.8Lx2.3Wx0.6Th	Local + grit		
5PE868.218a	Upper Body	A	1.6Lx1.8Wx0.8Th	Local + grit		
5PE868.218a	Upper Body	A	1.5Lx1.1Wx0.5Th	Local + grit		
5PE868.218a	Base	Smooth Ext&Int	1.7Lx1.2Wx0.8Th	Local + grit		
5PE868.218a	(14 frags)	A/Corregated	********************	Local + grit		
5PE868.238a	Upper Body	B	4.1Lx3.0Wx0.5Th	Local + grit		
5PE868.250a	Lower Body	B	4.6Lx3.3Wx0.9Th	Local + grit		
5PE868.250a	Lower Body	B	6.7Lx3.8Wx0.9Th	Local + grit		
5PE868.250a	Spall	?	********************	Local + grit		
5PE868.250a	(1)**********	*	********************	Local + grit		
5PE868.250a	Upper Body	B	1.4Lx1.4Wx0.6Th	Local + grit		
5PE868.250a	Spall	?	********************	Local + grit		
5PE868.250a	Upper Body	B	2.2Lx1.6Wx0.6Th	Local + grit	w/rt angle	inc lines
5PE868.250a	Upper Body	A	1.7Lx2.2Wx0.6Th	Local + grit	w/food adh	
5PE868.250a	Upper Body	B	2.7Lx2.5Wx0.5Th	Local + grit	w/food adh	
5PE868.250a	Lower Body	A	1.2Lx1.0Wx0.7Th	Local + grit		
5PE868.250a	Lower Body	A	1.4Lx1.4Wx0.7Th	Local + grit		
5PE868.250a	Lower Body	A	2.3Lx1.8Wx0.7Th	Local + grit		
5PE868.252a	Upper Body	B	3.4Lx6.7Wx0.5Th	Local + grit		
5PE868.253a	Upper Body	A	3.3Lx3.8Wx0.8Th	Local + grit		
5PE868.255a	Upper Body	A	3.7Lx3.2Wx0.6Th	Local + grit		
5PE868.255a	Upper Body	A	1.8Lx2.3Wx0.5Th	Local + grit		
5PE868.255a	Upper Body	B	2.2Lx3.7Wx0.5Th	Local + grit		
5PE868.255a	Upper Body	B	1.9Lx2.3Wx0.5Th	Local + grit		
5PE868.255a	Upper Body	A	2.3Lx1.3Wx0.5Th	Local + grit		
5PE868.255a	Upper Body	A	2.3Lx2.3Wx0.5Th	Local + grit		
5PE868.255a	Upper Body	B	1.0Lx1.0Wx0.4Th	Local + grit		
5PE868.255a	Upper Body	B	1.0Lx1.0Wx0.4Th	Local + grit		
5PE868.255a	Upper Body	B	0.5Lx0.5Wx0.4Th	Local + grit		
5PE868.255a	Lower Body	A	1.1Lx1.9Wx0.7Th	Local + grit		
5PE868.255a	Base	Smooth Ext&Int	1.5Lx1.2Wx0.8Th	Local + grit		

5PE868.255a	Upper Body	B	2.0Lx2.3Wx0.6Th	Local + grit		
5PE868.255a	Grit-tempered potting clay waster end cut from coil			Local + grit		
5PE868.255a	Lower Body	B	2.5Lx1.4Wx0.6Th	Local + grit		
5PE868.255a	Lower Body	B	1.2Lx1.5Wx0.6Th	Local + grit		
5PE868.255a	Lower Body	B	1.6Lx1.9Wx0.6Th	Local + grit		
5PE868.259a	Lower Body	B	1.9Lx1.7Wx0.7Th	Local + grit		
5PE868.259a	Upper Body	B	1.7Lx2.1Wx0.6Th	Local + grit		
5PE868.25a	Upper Body	B	1.7Lx1.4Wx0.4Th	Local + grit		
5PE868.25a	(1)**********	*	********************	Local + grit		
5PE868.266a	Base	Smooth Ext&Int	2.3Lx1.9Wx1.3Th	Local + grit		
5PE868.266a	Base	Smooth Ext&Int	2.0Lx2.0Wx0.8Th	Local + grit		
5PE868.268a	Lower Body	B	1.5Lx1.0Wx0.4Th	Local + grit		
5PE868.276a	Upper Body	B	2.6Lx3.4Wx0.5Th	Local + grit		
5PE868.280a	Lower Body	A	2.4Lx2.2Wx0.9Th	Local + grit		
5PE868.282a	Upper Body	B	2.5Lx2.4Wx0.4Th	Local + grit		
5PE868.282a	Lower Body	B	1.8Lx1.9Wx0.6Th	Local + grit		
5PE868.285a	Upper Body	A	2.5Lx1.4Wx0.6Th	Local + grit		
5PE868.285a	Upper Body	A	2.3Lx1.1Wx0.7Th	Local + grit		
5PE868.286a	Upper Body	B	2.3Lx2.5Wx0.4Th	Local + grit		
5PE868.286a	Lower Body	A	4.8Lx4.7Wx0.8Th	Local + grit		
5PE868.286a	Base	Smooth Ext&Int	2.7Lx2.4Wx0.9Th	Local + grit		
5PE868.286a	Lower Body	A	1.4Lx0.9Wx0.6Th	Local + grit		
5PE868.288a	Upper Body	A	1.1Lx1.5Wx0.5Th	Local + grit	w/1hz inc	line
5PE868.30a-s	Lower Body	A	2.9Lx2.9Wx0.7Th	Local + grit		
5PE868.315a	Lower Body	B	2.5Lx1.9Wx0.6Th	Local + grit		
5PE868.38a-s	Upper Body	A	1.6Lx1.1Wx0.5Th	Local + grit		
5PE868.3a	Lower Body	A	1.8Lx2.4Wx0.7Th	Local + grit		
5PE868.42a	Upper Body	A	1.4Lx1.4Wx0.5Th	Local + grit		
5PE868.42a	Upper Body	A	1.2Lx1.6Wx0.6Th	Local + grit		
5PE868.46a-s	Upper Body	B	2.7Lx2.3Wx0.6Th	Local + grit		
5PE868.47	Lower Body	A	2.0Lx2.0Wx0.7Th	Local + grit		
5PE868.4a-s	Lower Body	A	3.9Lx3.6Wx1.1Th	Local + grit		
5PE868.51a-s	Upper Body	A	2.0Lx1.7Wx0.5Th	Local + grit		
5PE868.52a-s	Lower Body	A	2.1Lx1.5Wx0.8Th	Local + grit		
5PE868.54a	Base	Smooth Ext&Int	1.5Lx1.4Wx0.7Th	Local + grit		
5PE868.59a	Upper Body	B	1.3Lx1.4Wx0.4Th	Local + grit		
5PE868.59a	Upper Body	B	1.1Lx1.2Wx0.4Th	Local + grit		
5PE868.59a	Upper Body	B	1.4Lx1.2Wx0.3Th	Local + grit		
5PE868.64a-s	Lower Body	A	3.9Lx1.8Wx0.9Th	Local + grit		
5PE868.64a-s	Upper Body	A	1.8Lx1.8Wx0.5Th	Local + grit		
5PE868.64a-s	Lower Body	A	1.9Lx2.2Wx0.9Th	Local + grit		
5PE868.64a-s	Base	Smooth Ext&Int	2.2Lx1.8Wx0.9Th	Local + grit		
5PE868.64a-s	Base	Smooth	2.4Lx1.8Wx0.9Th	Local + grit		

		Ext&Int			
5PE868.64a-s	Lower Body	B	4.1Lx2.1Wx0.6Th	Local + grit	
5PE868.64a-s	Lower Body	A	2.2Lx2.3Wx0.8Th	Local + grit	
5PE868.64a-s	Upper Body	A	3.0Lx3.4Wx0.6Th	Local + grit	
5PE868.64a-s	Upper Body	A	2.1Lx1.4Wx0.6Th	Local + grit	
5PE868.64a-s	Lower Body	A	2.1Lx1.3Wx0.8Th	Local + grit	
5PE868.64a-s	Upper Body	A	1.6Lx2.0Wx0.5Th	Local + grit	
5PE868.64a-s	Upper Body	A	1.9Lx1.4Wx0.5Th	Local + grit	
5PE868.64a-s	Upper Body	A	1.2Lx1.4Wx0.5Th	Local + grit	
5PE868.64a-s	Upper Body	B	1.6Wx1.5Lx0.4Th	Local + grit	
5PE868.64a-s	Lower Body	A	2.8Lx2.7Wx0.8Th	Local + grit	
5PE868.64a-s	Lower Body	A	2.8Lx3.2Wx0.8Th	Local + grit	
5PE868.64a-s	Upper Body	A	1.6Lx2.2Wx0.7Th	Local + grit	
5PE868.64a-s	Upper Body	A	1.9Lx1.5Wx0.5Th	Local + grit	
5PE868.64a-s	Lower Body	A	2.0Lx1.9Wx0.8Th	Local + grit	
5PE868.64a-s	Upper Body	Smooth Ext&Int	1.9Lx1.6Wx0.7Th	Local + grit	
5PE868.64a-s	Upper Body	A	2.4Lx1.7Wx0.7Th	Local + grit	
5PE868.64a-s	Lower Body	A	1.9Lx1.7Wx0.8Th	Local + grit	
5PE868.64a-s	Lower Body	A	1.8Lx1.9Wx0.8Th	Local + grit	
5PE868.64a-s	(4)**********	*	********************	Local + grit	
5PE868.64a-s	Upper Body	A	1.9Lx1.6Wx0.6Th	Local + grit	
5PE868.64a-s	Upper Body	A	2.1Lx1.9Wx0.6Th	Local + grit	
5PE868.64a-s	Upper Body	A	1.8Lx1.5Wx0.7Th	Local + grit	
5PE868.64a-s	Lower Body	A	2.2Lx1.5Wx0.7Th	Local + grit	
5PE868.64a-s	Lower Body	A	2.3Lx1.3Wx0.7Th	Local + grit	
5PE868.64a-s	(4)*********	*	********************	Local + grit	
5PE868.66	Upper Body	A	1.7Lx2.3Wx0.7Th	Local + grit	
5PE868.66a	Lower Body	A	1.1Lx0.8Wx0.6Th	Local + grit	
5PE868.66a	Base	Smooth Ext&Int	1.4Lx1.4Wx0.6Th	Local + grit	
5PE868.71a-s	Lower Body	A	1.5Lx2.5Wx0.8Th	Local + grit	
5PE868.74a	Upper Body	A	1.1Lx0.8Wx0.7Th	Local + grit	
5PE868.74a	Upper Body	A	1.8Lx1.5Wx0.7Th	Local + grit	
5PE868.74a	Spall			Local + grit	
5PE868.78a	Upper Body	A/Corregated	5.5Lx5.0Wx0.5Th	Local + grit	
5PE868.8a	Upper Body	A	2.4Lx1.6Wx0.6Th	Local + grit	
5PE868.99a	Upper Body	A	1.8Lx1.7Wx0.7Th	Local + grit	
5PE883.1a	Upper Body	B	2.3Lx2.1Wx0.4Th	Local + grit	
5PE883.1a	Upper Body	B	1.2Lx1.6Wx0.4Th	Local + grit	
5PE883.1a	Upper Body	B	1.3Lx1.7Wx0.4Th	Local + grit	
5PE883.1a	Upper Body	B	1.1Lx0.9Wx0.4Th	Local + grit	
5PE883.1a	Upper Body	B	0.9Lx0.5Wx0.4Th	Local + grit	
5PE883.1a	Upper Body	B	********************	Local + grit	
5PE896.10a	Upper Body	A	3.0Lx5.2Wx0.8Th	Local + grit	
5PE897.4a	Lower Body	A	2.2Lx1.8Wx0.6Th	Local + grit	
5PE904	Lower Body	B	3.5Lx4.4Wx0.6Th	Local + grit	
5PE904	Base	Smooth Int	3.9Lx3.9Wx1.0Th	Local + grit	cd imp ext
5PE904.2a-s	Lower Body	A	3.0Lx3.5Wx0.8Th	Local + grit	

5PE904.2a-s	Upper Body	A	2.3Lx1.8Wx0.9Th	Local + grit		
5PE904.2a-s	Upper Body	A	2.6Lx2.4Wx0.9Th	Local + grit		
5PE904.2a-s	Upper Body	A	1.5Lx1.7Wx0.7Th	Local + grit		
5PE904.2a-s	Upper Body	A	2.1Lx1.9Wx0.7Th	Local + grit		
5PE904.2a-s	(1)*********	*	*********************	Local + grit		
5PE904.2a-s	Lower Body	A	1.9Lx1.4Wx0.7Th	Local + grit		
5PE904.49a	Lower Body	A	2.2Lx2.0Wx0.8Th	Local + grit		
5PE904.4a	Lower Body	A	2.6Lx2.7Wx0.8Th	Local + grit		
5PE904.7a	Upper Body	A	1.8Lx2.4Wx0.5Th	Local + grit		
5PE910.22a	Upper Body	A	5.0Lx4.2Wx0.9Th	Local + grit		
5PE910.39a	Lower Body	A	4.2Lx4.3Wx0.8Th	Local + grit		
5PE915.32a	Lower Body	A	3.2Lx1.8Wx0.7Th	Local + grit		
5PE915.32a	(29)********	*	*********************	Local + grit		
5PE915.32a	Base	Smooth Ext&Int	2.2Lx1.6Wx0.9Th	Local + grit		
5PE915.32a	Upper Body	A	2.1Lx2.6Wx0.6Th	Local + grit		
5PE915.32a	Upper Body	SmW/striations	2.2Lx1.9Wx0.6Th	Local + grit		
5PE915.32a	Upper Body	A	1.8Lx1.7Wx0.5Th	Local + grit		
5PE915.32a	Upper Body	A	1.9Lx1.3Wx0.5Th	Local + grit		
5PE919.3a	Upper Body	A	2.4Lx1.8Wx0.6Th	Local + grit		
5PE925.10a	Lower Body	A	2.4Lx1.2Wx0.7Th	Local + grit		
5PE965.1a	Base	Smth Ext&Int	2.4Lx1.6Wx0.8Th	Local + grit		
5PE1047.20a	Lower Body	A	1.3Lx1.1Wx0.7Th	Local + grit		
5PE1571	Base	Smooth Ext&Int	2.0Lx1.9Wx0.9Th	Local + grit		
5PE1571	Lower Body	A	2.1Lx1.8Wx0.8Th	Local + grit		
5PE1571	Lower Body	A	1.9Lx3.1Wx0.8Th	Local + grit		
5PE1571.6a	All surfaces eroded		3.6Lx2.6Wx0.9Th	Local + grit	+Shldr	=25Cm
5PE1571.6a	All surfaces eroded		1.9Lx1.4Wx0.7Th	Local + grit		
5PE1798.0.5	Rim	B	3.4Lx4.7Wx0.7Th	Non-Local	+grit	2/St.Rim
5PE1798.0.5	Upper Body	B	4.6Lx8.0Wx0.7Th	Non-Local	+grit	
5PE1798.0.5	Upper Body	B	7.7Lx8.2Wx0.6Th	Non-Local	+grit	
5PE1861.1a	Lower Body	A /Sm Ext&Int	5.2Lx3.4Wx0.8Th	Non-Local	Grit&Pink	

FORT CARSON MILITARY BASE
CERAMIC-BEARING SITES IN EL PASO COUNTY

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5EP52.30a	Spall	Vert ci ext	1.3Lx1.5Wx0.3Th	Local + grit
5EP52.31a	Upper Body	A	1.3Lx1.2Wx0.6Th	Local + grit
5EP52.32a	Upper Body	A	2.1Lx2.8Wx0.6Th	Local + grit
5EP52.33a	Upper Body	A	1.8Lx1.0Wx0.5Th	Local + grit
5EP52.33a	Upper Body	A	2.2Lx1.2Wx0.5Th	Local + grit
5EP52.34a	Upper Body	A	1.3Lx1.8Wx0.5Th	Local + grit
5EP52.35a	Lower Body	A	1.2Lx1.2Wx0.7Th	Local + grit
5EP56.19a	(1)*********	*	********************	Local + grit
5EP56.19a	Lower Body	A/but smooth	2.4Lx4.7Wx0.8Th	Local + grit
5EP139.3c	(1)**********	*	********************	Local + grit
5EP139.3d	Base	Smooth Ext&Int	1.5Lx1.5Wx0.6Th	Local + grit
5EP141.35u	(1)*********	*	********************	Local + grit
5EP141.40a	Base	Smooth Ext&Int	2.0Lx1.7Wx0.7Th	Local + grit
5EP141.50b	Upper Body	B	1.6Lx1.7Wx0.5Th	Local + grit
5EP143	Upper Body	A	1.6Lx1.3Wx0.5Th	Local + grit
5EP143.10b	Lower Body	A	2.9Lx2.4Wx0.9Th	Local + grit
5EP143.11a	Upper Body	B	2.5Lx2.0Wx0.5Th	Local + grit
5EP143.13a	Upper Body	B	2.3Lx2.0Wx0.5Th	Local + grit
5EP143.14a	Upper Body	B	1.7Lx2.1Wx0.6Th	Local + grit
5EP143.15a	Upper Body	B	2.0Lx2.5Wx0.6Th	Local + grit
5EP143.16a	Lower Body	B	1.5Lx1.3Wx0.6Th	Local + grit
5EP143.17a	Upper Body	B	2.2Lx2.0Wx0.5Th	Local + grit
5EP143.19a	Upper Body	B	2.0Lx2.3Wx0.5Th	Local + grit
5EP143.20a	Upper Body	B	1.5Lx1.5Wx0.6Th	Local + grit
5EP143.21a	Lower Body	B	1.9Lx1.5Wx0.7Th	Local + grit
5EP143.22a	(1)**********	*	********************	Local + grit
5EP143.33b	Upper Body	B	1.4Lx1.3Wx0.5Th	Local + grit
5EP143.39b	Upper Body	B	0.9Lx1.4Wx0.5Th	Local + grit
5EP143.42c	(1)**********	*	*********************	Local + grit
5EP143.42d	Upper Body	A	1.2Lx1.0Wx0.5Th	Local + grit
5EP143.43a	Base	Smooth Ext&Int	1.4Lx1.1Wx0.7Th	Local + grit
5EP143.50h	Upper Body	B	3.0Lx1.8Wx0.4Th	Local + grit
5EP143.67a	Upper Body	B	0.6Lx1.0Wx0.5Th	Local + grit
5EP143.74a	Lower Body	A	2.3Lx2.0Wx0.7Th	Local + grit
5EP143.97	Upper Body	B	2.2Lx3.0Wx0.5Th	Local + grit
5EP143.a	Upper Body	B	1.5Lx2.1Wx0.5Th	Local + grit
5EP149.11b	Lower Body	A	2.0Lx1.8Wx0.8Th	Local + grit
5EP149.11c	Upper Body	A	1.8Lx1.1Wx0.7Th	Local + grit
5EP149.12c	Lower Body	B	3.0Lx1.5Wx0.7Th	Local + grit
5EP162.11a	Upper Body	B	1.7Lx1.8Wx0.6Th	Local + grit
5EP163.0.29	Upper Body	A	1.6Lx1.3Wx0.5Th	Local + grit
5EP165.0.19	Lower Body	A	2.5Lx1.8Wx0.6Th	Local + grit
5EP165.14a	Lower Body	A	2.5Lx1.9Wx0.9Th	Local + grit
5EP165.15a	(1)**********	*	********************	Local + grit

5EP165.16a	(1)*******	*	***************	Local + grit
5EP1080	Upper Body	B	3.2Lx3.2Wx0.6Th	Local + grit
5EP1080	Lower Body	A	1.9Lx2.3Wx0.7Th	Local + grit
5EP1080	Base	Smooth Ext&Int	1.5Lx1.7Wx0.8Th	Local + grit
5EP1080.14a	Lower Body	A	2.9Lx3.4Wx0.9Th	Local + grit
5EP1080.17a	Upper Body	B	3.0Lx2.5Wx0.5Th	Local + grit
5EP1080.25a	(1)*******	*	***************	Local + grit
5EP1080.29a	Base	Smooth Ext&Int	2.0Lx1.8Wx1.0Th	Local + grit
5EP1080.39a	Upper Body	A	1.9Lx2.2Wx0.6Th	Local + grit
5EP1080.41a	Upper Body	A	1.9Lx1.5Wx0.5Th	Local + grit
5EP1080.59a	Lower Body	A	2.5Lx1.9Wx0.8Th	Local + grit
5EP1080.59a	Upper Body	A	2.0Lx1.7Wx0.6Th	Local + grit
5EP1080.62a	Lower Body	A	1.8Lx2.0Wx0.9Th	Local + grit
5EP1080.8a	Upper Body	B	1.5Lx1.6Wx0.5Th	Local + grit
5EP1192	Upper Body	A	2.8Lx3.3Wx0.5Th	Local + grit
5EP1192.17a	(4)**********	*	*********************	Local + grit
5EP1192.19f	?????????	A	2.1Lx2.0Wx0.9Th	Local + grit
5EP1192.27a	Lower Body	B?	1.9Lx1.8Wx0.6Th	Local + grit
5EP1192.2a	Lower Body	A	1.7Lx2.0Wx0.8Th	Local + grit
5EP1192.2a	Lower Body	A	2.7Lx1.7Wx0.8Th	Local + grit
5EP1192.2a	Upper Body	A	1.5Lx1.8Wx0.7Th	Local + grit
5EP1192.2a	(1)**********	*	*********************	Local + grit
5EP1192.43	Upper Body	A	1.2Lx4.0Wx0.9Th	Local + grit
5EP1192.43	Upper Body	A	3.3Lx3.2Wx1.0Th	Local + grit
5EP1192.43	Lower Body	A	2.3Lx2.2Wx1.0Th	Local + grit
5EP1192.43	Lower Body	A	2.3Lx1.8Wx1.1Th	Local + grit
5EP1192.43	Lower Body	A	1.7Lx2.3Wx0.9Th	Local + grit
5EP1192.43	Upper Body	A	2.8Lx3.3Wx0.7Th	Local + grit
5EP1192.43	Lower Body	A	1.4Lx1.8Wx0.9Th	Local + grit
5EP1192.43	Lower Body	A	1.7Lx2.2Wx0.9Th	Local + grit
5EP1192.43	Lower Body	A	1.9Lx1.9Wx0.9Th	Local + grit
5EP1192.43	(6)*******	*	***************	Local + grit
5EP1192.43	(2)*******	*	***************	Local + grit
5EP1192.43	(5)*******	Smooth Ext&Int	***************	Local + grit
5EP1192.43a-s	Upper Body	A	2.9Lx2.4Wx0.9Th	Local + grit
5EP1192.4a	Upper Body	B	1.2Lx1.5Wx0.5Th	Local + grit
5EP1192.4a	?????????	B	1.0Lx0.9Wx0.4Th	Local + grit
5EP1192.52a	Lower Body	A	2.0Lx1.4Wx0.7Th	Local + grit
5EP1192.55a	(1)**********	*	*********************	Local + grit
5EP1208.20a	Upper Body	A	2.0Lx2.3Wx0.6Th	Local + grit
5EP1213.2a	Upper Body	B	1.2Lx2.1Wx0.5Th	Local + grit
5EP1213.3a	Upper Body	B	2.3Lx1.9Wx0.6Th	Local + grit
5EP1216.8a	Upper Body	A	2.5Lx2.7Wx0.6Th	Local + grit
5EP1339.53a	Lower Body	A	0.5Lx1.2Wx0.9Th	Local + grit
5EP1339.5a	(4)*******	**************	***************	Local + grit
5EP1339.5a	Lower Body	A	2.1Lx1.9Wx0.8Th	Local + grit

5EP1347.1a	Lower Body	A	1.6Lx1.2Wx0.7Th	Local + grit
5EP1347.2a	(1)*******	**************	***************	Local + grit
5EP1671.7a	Base	Smooth Ext&Int	2.3Lx1.7Wx1.0Th	Local + grit
5EP1671.7b	Base	Smooth Ext&Int	2.5Lx1.5Wx1.0Th	Local + grit
5EP1672.91a	Upper Body	A	1.6Lx1.4Wx0.6Th	Local + grit
5EP1672.91a	Upper Body	A	2.2Lx1.4Wx0.6Th	Local + grit
5EP1672.91a	Upper Body	A	1.2Lx1.9Wx0.6Th	Local + grit
5EP1672.91a	Upper Body	A	1.6Lx1.5Wx0.6Th	Local + grit
5EP1672.91a	Upper Body	A	1.5Lx1.9Wx0.6Th	Local + grit
5EP1672.91a	Lower Body	A	2.6Lx2.7Wx0.8Th	Local + grit
5EP1672.91a	Lower Body	A	2.8Lx2.3Wx0.7Th	Local + grit
5EP1672.91a	Lower Body	A	1.7Lx1.1Wx0.7Th	Local + grit
5EP1672.91a	Lower Body	A	2.8Lx2.1Wx0.8Th	Local + grit
5EP1672.91a	Lower Body	A	1.5Lx2.3Wx0.7Th	Local + grit
5EP1672.91a	(2)**********	*	********************	Local + grit
5EP1672.91a	Base	Smooth Ext&Int	2.0Lx2.0Wx0.9Th	Local + grit
5EP1672.91a	Base	Smooth Ext&Int	2.1Lx1.8Wx0.9Th	Local + grit
5EP1845.43a	(1)*********	*	********************	Local + grit

FORT CARSON MILITARY BASE
CERAMIC-BEARING SITES IN FREMONT COUNTY

5FN180
5FN181
5FN183
5FN184
5FN291
5FN503

5FN180.28a	Base	Smooth Ext&Int	2/4Lx2.0Wx1.0Th	Local + grit
5FN180.29a	Base	Smooth Ext&Int	2.9Lx2.3Wx0.9Th	Local + grit
5FN180.30a	Lower Body	A	2.0Lx1.9Wx0.6Th	Local + grit
5FN181.36a	Upper Body	A	1.6Lx2.5Wx0.7Th	Local + grit
5FN181.37a	Base	Smooth Ext&Int	1.5Lx1.1Wx0.9Th	Local + grit
5FN181.43a	Lower Body	A	1.4Lx1.6Wx0.8Th	Local + grit
5FN181.58g	Lower Body	A	1.5Lx2.0Wx0.7Th	Local + grit
5FN181.72b	Lower Body	A	2.0Lx2.1Wx0.7Th	Local + grit
5FN181.74b	Base	Smooth Ext&Int	2.5Lx1.9Wx0.6Th	Local + grit
5FN183.1k	Upper Body	A	2.4Lx2.8Wx0.9Th	Local + grit
5FN183.2b	(1)**********	*	********************	Local + grit
5FN184,17b	Upper Body	A	2.1Lx1.9Wx0.8Th	Local + grit
5FN184.17a	(1)**********	*	*******************	Local + grit
5FN184.17c	Upper Body	A	2.5Lx2.1Wx0.6Th	Local + grit
5FN184.39d	Lower Body	A	3.1Lx2.4Wx0.6Th	Local + grit
5FN291.4a	139 small fragments broken from a small bowl, coiled then smoothed exterior and interior; at least 9 coil breaks observed. 1 Lip sherd indicates rat-tail coil and round lip but no rim. Shallow hemispherical bowl ca. 5-6mm thick made from local clays and grit-tempered	A		
5FN503.14:	Upper Body	B	1.0Lx1.8Wx0.5Th	Local + grit
5FN503.14a	(1)**********	*	********************	Local + grit
5FN503.14c	Base	Smooth Ext&Int	2.1Lx1.0Wx0.8Th	Local + grit
5FN503.14e	Upper Body	B	1.8Lx2.2Wx0.6Th	Local + grit
5FN503.14f	Upper Body	A	2.5lx2.6Wx0.6Th	Local + grit
5FN503.14h	Upper Body	A	1.6Lx3.8Wx0.5Th	Local + grit
5FN503.14j	Upper Body	B	1.7Lx1.1Wx0.6Th	Local + grit
5FN503.14k	Lower Body	B	1.3Lx1.6Wx0.5Th	Local + grit
5FN503.15c	Upper Body	B	2.2Lx2.0Wx0.5Th	Local + grit
5FN503.15d	Upper Body	B	1.8Lx1.7Wx0.4Th	Local + grit
5FN503.16	Base	Smooth Ext&Int	1.5Lx1.4Wx0.7Th	Local + grit
5FN503.17j	Base	Smooth Ext&Int	1.5Lx1.2Wx0.8Th	Local + grit
5FN503.17k	Lower Body	B	1.8Lx2.0Wx0.6Th	Local + grit

5FN503.17l	Upper Body	B	1.7Lx1.9Wx0.5Th	Local + grit
5FN503.17n	Upper Body	B	1.3Lx2.0Wx0.5Th	Local + grit
5FN503.18d	Upper Body	A	1.4Lx1.6Wx0.6Th	Local + grit
5FN503.18i	Upper Body	B	0.9Lx1.7Wx0.6Th	Local + grit
5FN503.18k	Upper Body	B	1.8Lx2.5Wx0.5Th	Local + grit
5FN503.19c	Upper Body	B	1.9Lx1.2Wx0.5Th	Local + grit
5FN503.19d	Base	Smooth Ext&Int	1.4Lx1.1Wx0.9Th	Local + grit
5FN503.19f	Upper Body	A	2.0Lx2.5Wx0.6Th	Local + grit
5FN503.22a	Upper Body	B	2.0Lx1.6Wx0.5Th	Local + grit
5FN503.22t	Base	Smooth Ext&Int	1.7Lx1.7Wx0.8Th	Local + grit
5FN503.22u	Base	Smooth Ext&Int	1.4Lx1.3Wx0.6Th	Local + grit
5FN503.22v	Base	Smooth Ext&Int	1.9Lx1.4Wx0.6Th	Local + grit
5FN503.22w	Upper Body	B	2.1Lx1.2Wx0.5Th	Local + grit
5FN503.22y	Upper Body	B	2.0Lx2.2Wx0.5Th	Local + grit
5FN503.4a	Upper Body	A	1.7Lx2.3Wx0.6Th	Local + grit
5FN503.5b	(1)***********	*	*********************	Local + grit
5FN503.5b	Upper Body	A	2.5Lx1.9Wx0.6Th	Local + grit
5FN503.7b	Upper Body	A	1.8Lx1.9Wx0.6Th	Local + grit
5PN503.7c	Lower Body	A	1.9Lx2.0Wx0.8Th	Local + grit
5FN503.7d	Base	Smooth Ext&Int	2.0Lx1.5Wx0.7Th	Local + grit
5FN503.7e	Upper Body	A	1.9Lx1.9Wx0.6Th	Local + grit
5FN503.7f	Upper Body	B	2.0Lx1.8Wx0.4Th	Local + grit
5FN503.9a	Upper Body	A	2.1Lx2.3Wx0.6Th	Local + grit

APPENDIX II

SHOVEL TEST RESULTS, FCMR

Shovel Test Results, 5EP1080, FCMR.

Shovel Test No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
1	0 to 7	10YR 4/4, sod, silty loam with sand, loose to platey compaction, no $CaCO^3$	None
	7 to 39	10YR 5/4, silty loam with sand, weak blocky, some roots, heavy $CaCO^3$	
	39 to 55	10YR 5/8, silty loam with sand, weak blocky, heavy $CaCO^3$	
2	0 to 12	10YR 5/4, sod, silty loam with sand, weak angular blocky, weathered granite, heavy $CaCO^3$	None
	12 to 27	10YR 6/4, silty loam with sand, increase in sand, moderate angular blocky, roots, worm casts, heavy $CaCO^3$	
3	0 to 11	10YR 6/3, sod, loose sandy loam, weak, roots and organics, granite, quartz, quartzite, light $CaCO^3$	None
	11 to 17	10YR 5/4, silty loam with sand, moderate angular blocky, weathered granite, heavy $CaCO^3$	
	17 to 49	5YR 5/2, weathered shale	
4	0 to 7	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	None
	7 to 29	10YR 5/3, silty loam, weak structure, some roots and pebbles, rodent hole, moderate $CaCO^3$	
	29 to 52	10YR 6/4, silty loam with sand, increase sand, weak blocky, roots, heavy $CaCO^3$	
	52 to 70	10YR 5/2, very fine sand with silt, weak blocky to granular, small gravel, heavy $CaCO^3$	
5	0 to 6	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	None
	6 to 23	10YR 5/3, silty loam, weak structure, some roots, moderate $CaCO^3$	
	23 to 48	10YR 6/4, silty loam with sand, increased sand, weak blocky, roots, heavy $CaCO^3$	
	48 to 71	10YR 5/2, very fine sand with silt, weak blocky to granular, small gravel, heavy $CaCO^3$	
6	0 to 6	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	at 9cm: retouched flake; 0-10cm: modern metal
	6 to 27	10YR 5/3, silty loam, weak structure, some roots and pebbles, moderate $CaCO^3$	
	27 to 49	10YR 6/4, silty loam with sand, increase sand, weak blocky, roots, moderate $CaCO^3$ heavier at top	
	49 to 74	10YR 5/2, very fine sand with silt, weak blocky to granular, small gravel, heavy $CaCO^3$	
7	0 to 5	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	None
	5 to 26	10YR 5/3, silty loam, weak structure, some roots and pebbles, rodent hole, moderate $CaCO^3$	
	26 to 41	10YR 6/4, silty loam with sand, increase sand, weak blocky, roots, moderate $CaCO^3$, exfoliated rock at base	
	41 to 71	10YR 5/2, very fine sand with silt, weak blocky to granular, small gravel, heavy $CaCO^3$	

Shovel Test Results, 5EP1080, FCMR.

Shovel Test No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
8	0 to 5	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	None
	5 to 20	10YR 5/4, silty loam with sand, granular to weak blocky, small gravel, heavy $CaCO^3$	
	20 to 50	10YR 5/4, silty loam with increasing sand, granular to weak blocky, large exfoliating rock , heavy $CaCO^3$	
	50 to 71	10YR 5/2, very fine sand with silt, weak blocky to granular, small gravel, heavy $CaCO^3$	
9	0 to 4	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	35-50cm: ^{14}C sample
	4 to 19	10YR 5/3, silty loam with sand, weak structure, very compact, charcoal mottling, pebbles, moderate $CaCO^3$	
	19 to 50	10YR 5/4, silty loam with increasing sand, granular to weak blocky, large exfoliating rock at base, charcoal, heavy $CaCO^3$	
	50 to 74	10YR 5/2, very fine sand with silt, weak blocky to granular, small gravel, light charcoal, heavy $CaCO^3$	
10	0 to 3	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	0-15cm: 1 flake, 1 bone; 30-35cm: ^{14}C sample
	3 to 21	10YR 4/3, silty loam with sand, small pebbles and exfoliating rock, light $CaCO^3$	
	21 to 39	10YR 4/3, silty loam with sand, small pebbles and exfoliating rock, charcoal and partially burned juniper limb, less compact, light $CaCO^3$	
	39 to 51	10YR 5/2, very fine sand with silt, weak blocky to granular, small gravel, light charcoal, heavy $CaCO^3$	
11	0 to 5	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	40-52cm: 2 bone, 1 utilized flake, ^{14}C sample;
	5 to 22	10YR 4/3, silty loam with sand, weak structure, pebbles, compact, less exfoliating rock, moderate $CaCO^3$	
	22 to 52	10YR 4/3, silty loam with sand, weak structure, large gravel, bioturbation, artifacts and charcoal	52-65cm: 1 flake, ^{14}C sample
	52 to 70	10YR 5/2, very fine sand with silt, weak blocky to granular, small gravel, heavy $CaCO^3$ charcoal and artifacts at top	
12	0 to 5	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	15-20cm: 1 sherd; 20 -24cm: ^{14}C sample
	5 to 24	10YR 5/4, silty loam with sand, weak structure, compact, charcoal, moderate $CaCO^3$	
	24 to 39	10YR 6/4, silty loam with sand, weak structure, large gravel, heavy $CaCO^3$	
13	0 to 7	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	0-10cm: 1 bone; 25-30cm: 1 flake
	7 to 28	10YR 5/4, silty loam with sand, weak structure, compact, exfoliating rock, moderate $CaCO^3$	
	28 to 51	10YR 5/4, silty loam with sand, weak structure, compact, large gravel, moderate $CaCO^3$	

Shovel Test Results, 5EP1080, FCMR.

Shovel Test No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
	51 to 71	10YR 5/2, very fine sand with silt, weak blocky to granular, small gravel, heavy $CaCO^3$	
14	0 to 5	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	None
	5 to 24	10YR 5/4, silty loam with sand, weak structure, compact, exfoliating rock, moderate $CaCO^3$	
	24 to 53	10YR 5/4, silty loam with sand, weak structure, compact, large gravel, moderate $CaCO^3$	
	53 to 72	10YR 5/2, very fine sand with silt, weak blocky to granular, small gravel, heavy $CaCO^3$	
15	0 to 4	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	None
	4 to 23	10YR 5/4, silty loam with sand, weak angular blocky, disintegrated granite, few large cobbles, heavy $CaCO^3$	
	23 to 51	10YR 6/4, loamy sand, weak blocky, less inclusions, moderate $CaCO^3$	
	51 to 70	10YR 5/2, very fine sand with silt, weak blocky to granular, small gravel, heavy $CaCO^3$	
16	NA	Not excavated, in military feature	
17	0 to 5	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	None
	5 to 41	10YR 5/4, silty loam with sand, roots, weak angular blocky, no rock, bioturbation, heavy $CaCO^3$	
	41 to 71	10YR 5/2, very fine sand with silt, weak blocky to granular, small gravel, heavy $CaCO^3$	
18	0 to 6	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	None
	6 to 33	10YR 5/4, silty loam with sand, roots, weak angular blocky, no rock, moderate $CaCO^3$	
	33 to 72	10YR 5/2, very fine sand with silt, weak blocky to granular, small gravel, heavy $CaCO^3$	
19	0 to 5	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	0-20cm: 2 flakes
	5 to 22	10YR 4/3, silty loam, weak blocky, disintegrated rock, charcoal, moderate $CaCO^3$	
	22 to 46	10YR 5/4, silt loam with sand, roots, weak angular blocky, no rock, light $CaCO^3$	
	46 to 71	10YR 5/2, very fine sand with silt, weak blocky to granular, small gravel, heavy $CaCO^3$	
20	0 to 5	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	10-15cm: 1 flake, 1 retouched flake
	5 to 38	10YR 5/4, silty loam with sand, roots, weak angular blocky, no rock, moderate $CaCO^3$	
	38 to 73	10YR 5/2, very fine sand with silt, weak blocky to granular, small gravel, heavy $CaCO^3$	

Shovel Test Results, 5EP1080, FCMR.

Shovel Test No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
21	0 to 3	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	None
	3 to 23	10YR 5/4, silty loam with sand, roots, weak angular blocky, no rock, moderate $CaCO^3$	
	23 to 69	10YR 5/2, very fine sand, weak blocky to granular, small gravel, heavy $CaCO^3$	
22	0 to 5	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	5-15cm: 1 flake
	5 to 20	10YR 5/4, silty loam with sand, roots, weak angular blocky, no rock, moderate $CaCO^3$	
	20 to 53	10YR 5/2, coarse sand, granular, angular to subangular gravels, heavy $CaCO^3$	
	53 to 71	10YR 5/2, very fine sand, more loose, weak blocky to granular, small gravel, heavy $CaCO^3$	
23	0 to 4	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	None
	4 to 49	10YR 5/2, coarse sand with silt, angular to subangular gravels, granular, heavy $CaCO^3$	
	49 to 72	10YR 5/2, very fine sand, more loose, weak blocky to granular, small gravel, heavy $CaCO^3$	
24	0 to 3	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	None
	3 to 61	10YR 5/2, coarse sand with silt, angular to subangular gravels, granular, heavy $CaCO^3$	
	61 to 71	10YR 5/2, very fine sand, weak blocky to granular, increasing rock and more loose, heavy $CaCO^3$	
25	0 to 2	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	None
	2 to 70	10YR 5/2, coarse sand with silt, angular to subangular gravels, granular, heavy $CaCO^3$	
26	0 to 2	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	None
	2 to 71	10YR 5/2, coarse sand with silt, angular to subangular gravels, granular, heavy $CaCO^3$	
27	0 to 6	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	None
	6 to 15	10YR 4/3, silty loam with sand, weak structure, pebbles, compact, exfoliating rock, moderate $CaCO^3$	
	15 to 66	10YR 5/2, coarse sand with silt, angular to subangular gravels, granular, heavy $CaCO^3$	
28	0 to 5	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	10-20cm: 3 bone, ^{14}C sample;
	5 to 22	10YR 4/3, silty loam with sand, weak structure, pebbles, compact, charcoal, moderate $CaCO^3$	
	22 to 50	10YR 5/2, coarse sand with silt, granular, heavy $CaCO^3$	at 16cm: 1 flake

Shovel Test Results, 5EP1080, FCMR.

Shovel Test No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
29	0 to 9	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	0-10cm: 4 bone;
	9 to 30	10YR 4/3, silty loam with sand, weak structure, pebbles, compact, charcoal, moderate $CaCO^3$ buried cultural horizon	10-30cm: 2 bone, 5 sherds, 1 utilized flake, 1 biface,
	30 to 44	10YR 5/2, coarse sand with silt, granular, heavy $CaCO^3$	1 flake, charcoal sample
30	0 to 5	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	10-20cm: 1 flake
	5 to 20	10YR 4/3, silty loam with sand, weak structure, small pebbles and exfoliating rock, moderate $CaCO^3$	
	20 to 38	10YR 5/3, fine sand with small pebbles, weak blocky, moderate $CaCO^3$	
	38 to 50	10YR 5/2, very fine sand with silt, weak blocky to granular, small rocks, heavy $CaCO^3$	
31	0 to 5	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	0-10cm: 1 flake
	5 to 21	10YR 4/3, silty loam with sand, weak structure, fewer pebbles and exfoliating rock, moderate $CaCO^3$	
	21 to 29	10YR 5/2, very fine sand with silt, weak blocky to granular, small gravel, heavy $CaCO^3$	
32	0 to 4	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	None
	4 to 14	10YR 4/3, silty loam with sand, weak structure, fewer pebbles and exfoliating rock, moderate $CaCO^3$	
	14 to 24	10YR 5/2, very fine sand with increased silt, weak blocky to granular, small gravel, heavy $CaCO^3$	
33	0 to 14	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	0-15cm: 2 flakes;
	14 to 28	10YR 4/3, silty loam with sand, weak structure, pebbles, compact, charcoal, moderate $CaCO^3$ buried cultural horizon	15-28cm: 2 sherds, 2 bone; at 17cm: 1 sherd; at 16cm:
	28 to 47	10YR 5/2, coarse sand, granular, more small gravel, heavy $CaCO^3$	2 flakes; 0-28cm: 1 biface
34	0 to 7	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	20-25cm: 1 flake
	7 to 23	10YR 4/3, silty loam with sand, weak structure, pebbles, compact, less charcoal, moderate $CaCO^3$ buried cultural horizon	
	23 to 36	10YR 5/2, coarse sand, granular, more gravel, heavy $CaCO^3$	
35	0 to 9	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	None
	9 to 32	10YR 4/3, silty loam with sand, weak structure, pebbles, compact, moderate $CaCO^3$	

Shovel Test Results, 5EP1080, FCMR.

Shovel Test No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
	32 to 46	10YR 5/2, compact fine sand, weak blocky to granular, small gravel, heavy $CaCO^3$	
36	0 to 9	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	None
	9 to 31	10YR 4/3, silty loam with sand, weak structure, pebbles, compact, moderate $CaCO^3$	
	31 to 51	10YR 5/2, compact fine sand, weak blocky to granular, small gravel, heavy $CaCO^3$	
37	0 to 8	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	0-10cm: 1 retouched flake; 7-15cm: ^{14}C sample
	8 to 13	10YR 4/3, silty loam with sand, weak structure, pebbles, compact, moderate $CaCO^3$	
	13 to 41	10YR 5/2, very fine sand with silt, weak blocky to granular, small gravel, heavy $CaCO^3$	
38	0 to 8	10YR 5/3, sod, loose silty loam with sand, no $CaCO^3$	0-21cm: 1 bone,
	15 to 24	10YR 5/2, very fine sand with silt, weak blocky to granular, small gravel, heavy $CaCO^3$	

Average size 33.6 cm x 32.1 cm; Average depth 36 cm; Range 24cm- 74cm

Shovel Test Results, 5EP1345, FCMR.

Shovel Test No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
1	0 to 4	10YR 5/3, sod, silty loam, weak, subangular blocky, no $CaCO^3$	0-5cm: 1 flake
	4 to 13	10YR 3/4, silty loam, weak to moderate subangular blocky, roots, small amount of sandstone gravel, no $CaCO^3$	
	13 to 68	2.5YR 4/8, silty loam, weak to moderate subangular blocky, fewer roots, small sandstone gravel, heavy $CaCO^3$	
2	0 to 5	10YR 5/3, sod, silty loam, weak, subangular blocky, no $CaCO^3$	5-20cm: 1 flake
	5 to 14	10YR 3/4, silty loam, weak to moderate subangular blocky, roots, small amount of sandstone gravel, no $CaCO^3$	
	14 to 72	2.5YR 4/8, silty loam, weak to moderate subangular blocky, fewer roots, small sandstone gravel, heavy $CaCO^3$	
3	0 to 4	10YR 5/3, sod, silty loam, weak, subangular blocky, no $CaCO^3$	None
	4 to 14	10YR 3/4, silty loam, weak to moderate subangular blocky, roots, small amount of sandstone gravel, no $CaCO^3$	
	14 to 78	2.5YR 4/8, silty loam, weak to moderate subangular blocky, compact, fewer roots, more sandstone gravel, heavy $CaCO^3$	
4	0 to 4	10YR 5/3, sod, silty loam, weak, subangular blocky, no $CaCO^3$	None
	4 to 13	10YR 3/4, silty loam, weak to moderate subangular blocky, roots, small amount of sandstone gravel, no $CaCO^3$	
	13 to 71	2.5YR 4/8, silty loam, weak to moderate subangular blocky, compact, fewer roots, more sandstone gravel, heavy $CaCO^3$	
5	0 to 3	10YR 5/3, sod, silty loam, weak, subangular blocky, no $CaCO^3$	None
	3 to 12	10YR 3/4, silty loam, weak to moderate subangular blocky, roots, small amount of sandstone gravel, no $CaCO^3$	
	12 to 72	2.5YR 4/8, silty loam, weak to moderate subangular blocky, compact, fewer roots, less sandstone gravel, heavy $CaCO^3$	
6	0 to 3	10YR 5/3, sod, silty loam, weak, subangular blocky, no $CaCO^3$	None
	3 to 13	10YR 3/4, silty loam, weak to moderate subangular blocky, roots, small amount of sandstone gravel, no $CaCO^3$	
	13 to 70	2.5YR 4/8, silty loam, weak to moderate subangular blocky, compact, fewer roots, less sandstone gravel, heavy $CaCO^3$	
7	0 to 4	10YR 5/3, sod, silty loam, weak, subangular blocky, no $CaCO^3$	None
	4 to 13	10YR 3/4, silty loam, weak to moderate subangular blocky, roots, small amount of sandstone gravel, no $CaCO^3$	
	13 to 70	2.5YR 4/8, silty loam, weak to moderate subangular blocky, compact, fewer roots, less sandstone gravel, heavy $CaCO^3$	
8	0 to 4	10YR 5/3, sod, silty loam, weak, subangular blocky, no $CaCO^3$	None
	4 to 14	10YR 3/4, silty loam, weak to moderate subangular blocky, roots, small amount of sandstone gravel, no $CaCO^3$	
	14 to 86	2.5YR 4/8, silty loam, weak to moderate subangular blocky, compact, fewer roots, sandstone gravel, heavy $CaCO^3$	

Shovel Test Results, 5EP1345, FCMR.

Shovel Test No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
9	0 to 4	10YR 5/3, sod, silty loam, weak, subangular blocky, no $CaCO^3$	None
	4 to 15	10YR 3/4, silty loam, weak to moderate subangular blocky, roots, small amount of sandstone gravel, no $CaCO^3$	
	15 to 72	2.5YR 4/4, silty loam, weak to moderate subangular blocky, less sandstone gravel, no $CaCO^3$	
10	0 to 4	10YR 5/3, sod, silty loam, weak, subangular blocky, no $CaCO^3$	None
	4 to 14	10YR 3/4, silty loam, weak to moderate subangular blocky, roots, small amount of sandstone gravel, no $CaCO^3$	
	14 to 71	2.5YR 4/8, silty loam, weak to moderate subangular blocky, compact, fewer roots, sandstone gravel, heavy $CaCO^3$	
11	0 to 5	10YR 5/3, sod, silty loam, weak, subangular blocky, no $CaCO^3$	5-15cm: 1 flake
	5 to 18	10YR 3/4, silty loam, weak to moderate subangular blocky, roots, small amount of sandstone gravel, no $CaCO^3$	
	18 to 76	2.5YR 4/8, silty loam, weak to moderate subangular blocky, compact, fewer roots, sandstone gravel, heavy $CaCO^3$	
12	0 to 5	10YR 5/3, sod, silty loam, weak, subangular blocky, no $CaCO^3$	0-10cm: 1 flake;
	5 to 25	10YR 3/4, silty loam, weak to moderate subangular blocky, roots, small amount of sandstone gravel, no $CaCO^3$	10-25cm: 1 flake
	25 to 70	2.5YR 4/8, silty loam, weak to moderate subangular blocky, compact, fewer roots, sandstone gravel, heavy $CaCO^3$	
13	0 to 5	10YR 5/3, sod, silty loam, weak, subangular blocky, no $CaCO^3$	None
	5 to 17	10YR 3/4, silty loam, weak to moderate subangular blocky, roots, small amount of sandstone gravel, no $CaCO^3$	
	17 to 71	2.5YR 4/8, silty loam, weak to moderate subangular blocky, compact, fewer roots, sandstone gravel, heavy $CaCO^3$	
14	0 to 3	10YR 5/3, sod, silty loam, weak, subangular blocky, no $CaCO^3$	None
	3 to 14	10YR 3/4, silty loam, weak to moderate subangular blocky, roots, small amount of sandstone gravel, no $CaCO^3$	
	14 to 66	2.5YR 4/8, silty loam, weak to moderate subangular blocky, compact, fewer roots, sandstone gravel, heavy $CaCO^3$	
15	0 to 4	10YR 5/3, sod, silty loam, weak, subangular blocky, no $CaCO^3$	None
	4 to 13	10YR 3/4, silty loam, weak to moderate subangular blocky, roots, small amount of sandstone gravel, no $CaCO^3$	
	13 to 72	2.5YR 4/8, silty loam, weak to moderate subangular blocky, compact, fewer roots, sandstone gravel, heavy $CaCO^3$	
16	0 to 4	10YR 5/3, sod, silty loam, weak, subangular blocky, no $CaCO^3$	0-5cm: 1 biface;
	4 to 12	10YR 3/4, silty loam, weak to moderate subangular blocky, roots, small amount of sandstone gravel, no $CaCO^3$	5-10cm: 1 flake
	12 to 63	2.5YR 4/8, silty loam, weak to moderate subangular blocky, compact, fewer roots, sandstone gravel, heavy $CaCO^3$	

Shovel Test Results, 5EP1345, FCMR.

Shovel Test No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
17	0 to 4	10YR 5/3, sod, silty loam, weak, subangular blocky, no $CaCO^3$	None
	4 to 11	10YR 3/4, silty loam, weak to moderate subangular blocky, roots, small amount of sandstone gravel, no $CaCO^3$	
	11 to 72	2.5YR 4/8, silty loam, weak to moderate subangular blocky, compact, fewer roots, sandstone gravel, heavy $CaCO^3$	

Average size 32.5 cm x 32.4 cm; Average depth 71.8 cm; Range in depth 63 cm- 86 cm

Shovel Test Results, 5PE750, FCMR.

Shovel Test No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
1	0 to 5	10YR 5/4, sod, loose sand with silt, roots, no $CaCO^3$	0-11cm: 1 flake
	5 to 12	10YR 4/3, sandy loam, moderate subangular blocky, few sandstone gravels, roots, no $CaCO^3$	
	12 to 24	10YR 4/6, clay loam, moderate angular blocky, compact, roots, slight $CaCO^3$	
	24 to 50	10YR 6/3, sandy loam with silt, weak subangular blocky, compact, sandstone gravels, roots, heavy $CaCO^3$	
	50	Sandstone bedrock	
2	0 to 5	10YR 5/4, sod, loose sand with silt, roots, no $CaCO^3$	10-20cm: 1 core fragment; 20-30cm: 2 flakes
	5 to 11	10YR 4/3, sandy loam, moderate subangular blocky, few sandstone gravels, roots, no $CaCO^3$	
	11 to 20	10YR 4/6, clay loam, moderate angular blocky, compact, roots, slight $CaCO^3$	
	20 to 42	10YR 6/3, sandy loam with silt, weak subangular blocky, compact, sandstone gravels, roots, heavy $CaCO^3$	
	42	Sandstone bedrock	
3	0 to 4	10YR 5/4, sod, loose sand with silt, roots, no $CaCO^3$	None
	4 to 13	10YR 4/3, sandy loam, moderate subangular blocky, few sandstone gravels, roots, no $CaCO^3$	
	13 to 27	10YR 4/6, clay loam, moderate angular blocky, compact, roots, slight $CaCO^3$	
	27 to 55	10YR 6/3, sandy loam with silt, weak subangular blocky, compact, sandstone gravels, roots, heavy $CaCO^3$	
	55	Sandstone bedrock	
4	0 to 3	10YR 5/4, sod, loose sand with silt, roots, no $CaCO^3$	0-2cm: 2 flakes
	3 to 8	10YR 4/3, sandy loam, moderate subangular blocky, few sandstone gravels, roots, no $CaCO^3$	
	8 to12	10YR 4/6, clay loam, moderate angular blocky, compact, roots, slight $CaCO^3$	
	12 to 24	10YR 6/3, sandy loam with silt, weak subangular blocky, compact, sandstone gravels, roots, heavy $CaCO^3$	
	24	Sandstone bedrock	
5	0 to 5	10YR 5/4, sod, loose sand with silt, roots, no $CaCO^3$	None
	5 to 10	10YR 4/3, sandy loam, moderate subangular blocky, few sandstone gravels, roots, no $CaCO^3$	
	10 to 16	10YR 4/6, clay loam, moderate angular blocky, compact, roots, slight $CaCO^3$	
	16 to 33	10YR 6/3, sandy loam with silt, weak subangular blocky, compact, sandstone gravels, roots, heavy $CaCO^3$	
	33	Sandstone bedrock	

Shovel Test Results, 5PE750, FCMR.

Shovel Test No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
6	0 to 4	10YR 5/4, sod, loose sand with silt, roots, no $CaCO^3$	None
	4 to 13	10YR 4/3, sandy loam, moderate subangular blocky, few sandstone gravels, roots, no $CaCO^3$	
	13 to 25	10YR 3/4, sandy loam, moderate subangular blocky, dead tree roots, heavy organics, moderate $CaCO^3$	
	25 to 31	10YR 6/3, sandy loam with silt, weak subangular blocky, compact, sandstone gravels, roots, heavy $CaCO^3$	
	31	Large sandstone slabs	
7	0 to 4	10YR 5/4, sod, loose sand with silt, roots, no $CaCO^3$	0-13cm: 1 flake; 35-40cm: 1 flake
	4 to 15	10YR 3/4, sandy loam, moderate subangular blocky, roots, organics, moderate $CaCO^3$	
	15 to 43	10YR 6/3, sandy loam with silt, weak subangular blocky, compact, sandstone gravels, roots, heavy $CaCO^3$	
	43	Large sandstone slabs	
8	0 to 3	10YR 5/4, sod, loose sand with silt, roots, no $CaCO^3$	None
	3 to 9	10YR 4/3, sandy loam, moderate subangular blocky, few sandstone gravels, roots, no $CaCO^3$	
	9 to 20	10YR 3/4, sandy loam, moderate subangular blocky, roots, organics, moderate $CaCO^3$	
	20 to 26	10YR 6/3, sandy loam with silt, weak subangular blocky, compact, sandstone gravels, roots, heavy $CaCO^3$	
	26	Large, tilted sandstone slab	
9	0 to 4	10YR 5/4, sod, loose sand with silt, roots, no $CaCO^3$	10-25cm: 1 flake
	4 to 10	10YR 4/3, sandy loam, moderate subangular blocky, few sandstone gravels, roots, no $CaCO^3$	
	10 to 27	10YR 3/4, sandy loam, moderate subangular blocky, roots, organics, moderate $CaCO^3$	
	27	Sandstone bedrock	
10	0 to 3	10YR 5/4, sod, loose sand with silt, roots, no $CaCO^3$	0-10cm: 1 flake
	3 to 10	10YR 4/3, sandy loam, moderate subangular blocky, few sandstone gravels, roots, no $CaCO^3$	
	10 to 22	10YR 3/4, sandy loam, moderate subangular blocky, roots, organics, moderate $CaCO^3$	
	22 to 34	10YR 6/3, sandy loam with silt, weak subangular blocky, compact, sandstone gravels, roots, heavy $CaCO^3$	
	34	Sandstone bedrock	
11	0 to 4	10YR 5/4, sod, loose sand with silt, roots, no $CaCO^3$	10-25cm: 1 flake at 22cm: charcoal fleck
	4 to 10	10YR 4/3, sandy loam, moderate subangular blocky, few sandstone gravels, roots, no $CaCO^3$	

Shovel Test Results, 5PE750, FCMR.

Shovel Test No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
	10 to 20	10YR 3/4, sandy loam, moderate subangular blocky, roots, organics, moderate $CaCO^3$	(not collected)
	20 to 34	10YR 6/3, sandy loam with silt, weak subangular blocky, compact, sandstone gravels, roots, heavy $CaCO^3$	
	34	Sandstone bedrock	
12	0 to 4	10YR 5/4, sod, loose sand with silt, roots, no $CaCO^3$	None
	4 to 12	10YR 3/4, sandy loam, moderate subangular blocky, roots, organics, moderate $CaCO^3$	
	12 to 36	10YR 6/3, sandy loam with silt, weak subangular blocky, compact, sandstone gravels, roots, heavy $CaCO^3$	
	36	Sandstone bedrock	
13	0 to 3	10YR 5/4, sod, loose sand with silt, roots, no $CaCO^3$	None
	3 to 10	10YR 4/3, sandy loam, moderate subangular blocky, few sandstone gravels, roots, no $CaCO^3$	
	10 to 19	10YR 3/4, sandy loam, moderate subangular blocky, roots, organics, moderate $CaCO^3$	
	19 to 41	10YR 6/3, sandy loam with silt, weak subangular blocky, compact, sandstone gravels, roots, heavy $CaCO^3$	
	41	Sandstone bedrock	
14	0 to 3	10YR 5/4, sod, loose sand with silt, roots, no $CaCO^3$	10-20cm: 1 flake
	3 to 12	10YR 4/3, sandy loam, moderate subangular blocky, few sandstone gravels, roots, no $CaCO^3$	
	12 to 31	10YR 4/6, clay loam, moderate angular blocky, very compact, roots, slight $CaCO^3$	
	31	Large pieces of sandstone	
15	0 to 3	10YR 5/4, sod, loose sand with silt, roots, no $CaCO^3$	None
	3 to 11	10YR 4/3, sandy loam, moderate subangular blocky, few sandstone gravels, roots, no $CaCO^3$	
	11 to 32	10YR 4/6, clay loam, moderate angular blocky, very compact, roots, slight $CaCO^3$	
	32	Large tree root	
16	0 to 3	10YR 5/4, sod, loose sand with silt, roots, no $CaCO^3$	None
	3 to 12	10YR 4/3, sandy loam, moderate subangular blocky, few sandstone gravels, roots, no $CaCO^3$	
	12 to 42	10YR 4/6, clay loam, moderate angular blocky, very compact, roots, slight $CaCO^3$	
17	0 to 5	10YR 5/3, sod, loose, fine sand with silt, granular, roots, no $CaCO^3$	None

Shovel Test Results, 5PE750, FCMR.

Shovel Test No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
	5 to 34	10YR 5/6, sandy loam, weak angular blocky, angular sandstone gravel, heavy $CaCO^3$	
	34 to 52	10YR 6/4, sandy loam, weak angular blocky, increased sandstone gravel, heavy $CaCO^3$	
	52 to 74	10YR 7/4, weathered sandstone bedrock, granular, heavy $CaCO^3$, increases with depth	
18	0 to 6	10YR 5/3, sod, loose, fine sand with silt, granular, roots, no $CaCO^3$	None
	6 to 30	10YR 5/6, sandy loam, weak angular blocky, angular sandstone gravel, heavy $CaCO^3$	
	30 to 51	10YR 6/4, sandy loam, weak angular blocky, increased sandstone gravel, heavy $CaCO^3$	
	51 to 73	10YR 7/4, weathered sandstone bedrock, granular, heavy $CaCO^3$, increases with depth	
19	0 to 10	10YR 5/3, sod, loose, fine sand with silt, granular, roots, no $CaCO^3$	None
	10 to 44	10YR 7/4, weathered sandstone bedrock, granular, heavy $CaCO^3$, increases with depth	
20	0 to 8	10YR 5/3, sod, loose, fine sand with silt, granular, roots, no $CaCO^3$	None
	8 to 35	10YR 5/6, sandy loam, weak angular blocky, angular sandstone gravel, heavy $CaCO^3$	
	35 to 50	10YR 7/4, weathered sandstone bedrock, granular, heavy $CaCO^3$, increases with depth	
21	0 to 6	10YR 5/3, sod, loose, fine sand with silt, granular, roots, no $CaCO^3$	None
	6 to 32	10YR 5/6, sandy loam, weak angular blocky, angular sandstone gravel, heavy $CaCO^3$	
	32 to 54	10YR 7/4, weathered sandstone bedrock, granular, heavy $CaCO^3$, increases with depth	
22	0 to 9	10YR 5/3, sod, loose, fine sand with silt, granular, roots, no $CaCO^3$	None
	9 to 40	10YR 5/6, sandy loam, weak angular blocky, angular sandstone gravel, heavy $CaCO^3$	
	40 to 52	10YR 7/4, weathered sandstone bedrock, granular, heavy $CaCO^3$, increases with depth	
23	0 to 6	10YR 5/3, sod, loose, fine sand with silt, granular, roots, no $CaCO^3$	None
	6 to 24	10YR 5/6, sandy loam, weak angular blocky, angular sandstone gravel, heavy $CaCO^3$	
	24 to 52	10YR 7/4, weathered sandstone bedrock, granular, heavy $CaCO^3$, increases with depth	
	52	Very large pieces of sandstone	

Shovel Test Results, 5PE750, FCMR.

Shovel Test No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
24	0 to 10	10YR 5/3, sod, loose, fine sand with silt, granular, roots, no $CaCO^3$	None
	10 to 28	10YR 5/6, sandy loam, weak angular blocky, angular sandstone gravel, heavy $CaCO^3$	
	28 to 58	10YR 7/4, weathered sandstone bedrock, granular, heavy $CaCO^3$, increases with depth	
25	0 to 10	10YR 5/3, sod, loose, fine sand with silt, granular, roots, no $CaCO^3$	None
	10 to 44	10YR 7/4, weathered sandstone bedrock, granular, heavy $CaCO^3$, increases with depth	
	44	Large pieces of sandstone	
		Average size 32.7 cm x 31.2; Average depth 43.3 cm; Range in depth 24 cm - 74 cm	

Shovel Test Results, 5PE1610, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
1	0 to 27	10YR 4/2, loose sandy loam, single grain, decomposing sandstone, slight $CaCO^3$	None
2	0 to 20	10YR 2/2, humus, loose sandy loam, charcoal, packrat debris, slight $CaCO^3$	40-60cm: bone (10);
	20 to 74	10YR 6/4, loose sand, decomposing sandstone, charcoal, moderate $CaCO^3$	60-70cm: ^{14}C sample
3	0 to 12	10YR 6/2, loose sandy loam, single grain, decomposing sandstone, slight $CaCO^3$	0-20cm: rodent bone (3)
	12 to 70	10YR 5/4, loose sandy loam, single grain, decomposing sandstone, moderate $CaCO^3$	

Average size 34 cm x 29.3 cm; Average depth 57 cm; Range 27 cm - 74 cm

Shovel Test Results, 5PE1785, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
1	0 to 3	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	None
	3 to 13	10YR 4/4-4/3, silt loam to silty clay loam, weak to moderate blocky, roots, slight $CaCO^3$	
	13 to 57	10YR 5/1-5/4, shaley clay, platy to medium blocky, few roots, moderate to high $CaCO^3$	
	57 to 69	10YR 5/3-4/3, clay loam to clay, very platy structure, high $CaCO^3$	
2	0 to 4	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	None
	4 to 20	10YR 4/4-4/3, silt loam to silty clay loam, weak to moderate blocky, roots, slight $CaCO^3$	
	20 to 33	10YR 5/4-6/4, clay loam to clay, moderate blocky, moderate $CaCO^3$	
	33 to 40	10YR 5/1-5/4, shaley clay, platy to medium blocky, few roots, moderate to high $CaCO^3$	
3	0 to 5	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	None
	5 to 28	10YR 4/4-4/3, silt loam to silty clay loam, weak to moderate blocky, roots, slight $CaCO^3$	
	28 to 45	10YR 5/4-6/4, clay loam to clay, moderate blocky, moderate $CaCO^3$	
	45 to 65	10YR 5/1-5/4, shaley clay, platy to medium blocky, less shale then preceding test, less gray in color, few roots, moderate high $CaCO^3$	
4	0 to 5	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	None
	5 to 23	10YR 4/4-4/3, silt loam to silty clay loam, weak to moderate blocky, roots, slight $CaCO^3$	
	23 to 60	10YR 5/4-6/4, clay loam to clay, moderate blocky, light shale mottling near base, moderate $CaCO^3$	
5	0 to 4	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	None
	4 to 16	10YR 4/3, silt loam to silty clay loam, weak to moderate blocky, roots, slight $CaCO^3$	
	16 to 34	10YR 4/4, clay loam, blocky and very compact, heavy $CaCO^3$	
	34 to 70	10YR 5/4, clay loam to clay, moderate blocky, moderate $CaCO^3$	
6	0 to 4	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	0-20cm: 1 retouched flake
	4 to 11	10YR 4/3, silt loam to silty clay loam, weak to moderate blocky, roots, slight $CaCO^3$	
	11 to 38	10YR 4/4, clay loam, blocky and very compact, heavy $CaCO^3$	
	38 to 65	10YR 5/4, clay loam to clay, moderate blocky, moderate $CaCO^3$	

Shovel Test Results, 5PE1785, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
7	0 to 4	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	None
	4 to 13	10YR 4/3, silt loam to silty clay loam, weak to moderate blocky, roots, slight $CaCO^3$	
	13 to 36	10YR 4/4, clay loam, blocky and very compact, heavy $CaCO^3$	
	36 to 68	10YR 5/4, clay loam to clay, moderate blocky, moderate $CaCO^3$	
8	0 to 3	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	0-10cm: 1 flake;
	3 to 12	10YR 4/3, silt loam to silty clay loam, weak to moderate blocky, roots, slight $CaCO^3$	10-20cm: 1 flake;
	12 to 33	10YR 4/4, clay loam, blocky and very compact, heavy $CaCO^3$	30-40cm: 1 flake
	33 to 52	10YR 5/4, clay loam to clay, moderate blocky, moderate $CaCO^3$	
9	0 to 3	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	0-5cm: 1 flake
	3 to 12	10YR 4/3, silt loam to silty clay loam, weak to moderate blocky, roots, slight $CaCO^3$	
	12 to 32	10YR 4/4, clay loam, blocky and very compact, heavy $CaCO^3$	
	32 to 52	10YR 5/4, clay loam to clay, moderate blocky, moderate $CaCO^3$	
10	0 to 3	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	10-20cm: 1 flake;
	3 to 10	10YR 4/3, silt loam to silty clay loam, weak to moderate blocky, roots, slight $CaCO^3$	20-25cm: 1 flake;
	10 to 42	10YR 4/4, clay loam, blocky and very compact, increase in sandstone gravel, heavy $CaCO^3$	0-25cm: 1 flake
	42 to 50	10YR 5/4, clay loam to clay, moderate blocky, moderate $CaCO^3$	
11	0 to 3	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	0-10cm: 1 utilized flake
	3 to 13	10YR 4/3, silt loam to silty clay loam, weak to moderate blocky, roots, slight $CaCO^3$	
	13 to 24	10YR 4/4, clay loam, blocky and very compact, large sandstone gravel, heavy $CaCO^3$	
	24	Large pieces of colluvial sandstone	
12	0 to 3	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	0-5cm: 1 utilized flake;
	3 to 19	10YR 3/2, silt loam with sand, weak blocky, higher organic content, moderate $CaCO^3$	10-20cm: 1 flake;
	19 to 30	10YR 4/4, clay loam, blocky and very compact, mottled with upper stratum, heavy $CaCO^3$	20-25cm: 1 utilized flake
	30 to 34	10YR 5/1-5/4, shaley clay, platy to medium blocky, few roots, moderate to high $CaCO^3$	

Shovel Test Results, 5PE1785, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
13	0 to 4	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	None
	4 to 22	10YR 3/2, silt loam with sand, weak blocky, higher organic content, moderate $CaCO^3$	
	22	Large pieces of colluvial sandstone	
14	0 to 6	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	None
	6 to 34	10YR 4/4, sandy loam , weak blocky, small to large sandstone gravels, roots, moderate $CaCO^3$	
	34	Large pieces of colluvial sandstone	
15	0 to 4	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	None
	4 to 14	10YR 4/4, sandy loam , weak blocky, small to large sandstone gravels, roots, moderate $CaCO^3$	
	14 to 40	10YR 5/4, clay loam, moderate blocky, heavy $CaCO^3$	
	40 to 70	10YR 5/4 clay loam, weak blocky, compact, heavy $CaCO^3$	
16	0 to 5	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	None
	5 to 13	10YR 4/3, silt loam to silty clay loam, weak to moderate blocky, roots, slight $CaCO^3$	
	13 to 39	10YR 4/4, clay loam, blocky and very compact, large sandstone gravel, heavy $CaCO^3$	
	39	Large pieces of colluvial sandstone	
17	0 to 5	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	0-5cm: 1 flake
	5 to 9	10YR 4/3, silt loam to silty clay loam, weak to moderate blocky, roots, slight $CaCO^3$	
	9 to 30	10YR 4/4, clay loam, blocky and very compact, sandstone gravel, heavy $CaCO^3$	
	30	Large tree root	
18	0 to 5	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	None
	5 to 12	10YR 4/3, silt loam to silty clay loam, weak to moderate blocky, roots, slight $CaCO^3$	
	12 to 42	10YR 4/4, clay loam, blocky and very compact, sandstone gravel, heavy $CaCO^3$	
	42 to 50	10YR 5/1-5/4, shaley clay, platy to medium blocky, few roots, moderate to high $CaCO^3$	
19	0 to 4	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	0-5cm: 1 biface

Shovel Test Results, 5PE1785, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
	4 to 12	10YR 4/3, silt loam to silty clay loam, weak to moderate blocky, roots, slight $CaCO^3$	
	12 to 49	10YR 4/4, clay loam, blocky and very compact, sandstone gravel, heavy $CaCO^3$	
20	0 to 4	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	0-5cm: 1 biface fragment, 2 flakes; 5-10cm: 1 flake
	4 to 12	10YR 4/3, silt loam to silty clay loam, weak to moderate blocky, roots, slight $CaCO^3$	
	12 to 37	10YR 4/4, clay loam, blocky and very compact, sandstone gravel, heavy $CaCO^3$	
	37 to 50	10YR 5/4, clay loam to clay, moderate blocky, moderate $CaCO^3$	
21	0 to 5	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	None
	5 to 13	10YR 3/2, silt loam with sand, weak blocky, higher organic content, moderate $CaCO^3$	
	13 to 46	10YR 5/4 clay loam, weak blocky, compact, heavy $CaCO^3$	
22	0 to 4	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	0-10cm: 1 flake
	4 to 12	10YR 3/2, silt loam with sand, weak blocky, higher organic content, moderate $CaCO^3$	
	12 to 41	10YR 5/4 clay loam, weak blocky, compact, heavy $CaCO^3$	
23	0 to 4	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	None
	4 to 11	10YR 4/3, silt loam to silty clay loam, weak to moderate blocky, roots, slight $CaCO^3$	
	11 to 40	10YR 4/4, clay loam, blocky and very compact, sandstone gravel, heavy $CaCO^3$	
24	0 to 4	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	None
	4 to 14	10YR 4/3, silt loam to silty clay loam, weak to moderate blocky, roots, slight $CaCO^3$	
	14 to 44	10YR 4/4, clay loam, blocky and very compact, sandstone gravel, heavy $CaCO^3$	
25	0 to 5	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	None
	5 to 12	10YR 4/3, silt loam to silty clay loam, weak to moderate blocky, roots, slight $CaCO^3$	
	12 to 35	10YR 4/4, clay loam, blocky and very compact, sandstone gravel, heavy $CaCO^3$	
	35 to 49	10YR 5/4, clay loam to clay, moderate blocky, sandstone gravel, moderate $CaCO^3$	

Shovel Test Results, 5PE1785, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
26	0 to 5	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	None
	5 to 13	10YR 4/3, silt loam to silty clay loam, weak to moderate blocky, roots, slight $CaCO^3$	
	13 to 34	10YR 4/4, clay loam, blocky and very compact, sandstone gravel, heavy $CaCO^3$	
	34 to 42	10YR 5/4, clay loam to clay, moderate blocky, sandstone gravel, moderate $CaCO^3$	
27	0 to 6	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	None
	6 to 14	10YR 4/3, silt loam to silty clay loam, weak to moderate blocky, roots, slight $CaCO^3$	
	14 to 33	10YR 4/4, clay loam, blocky and very compact, sandstone gravel, heavy $CaCO^3$	
	33 to 38	10YR 5/4, clay loam to clay, moderate blocky, sandstone gravel, moderate $CaCO^3$	
28	0 to 4	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	None
	4 to 15	10YR 4/3, silt loam to silty clay loam, weak to moderate blocky, roots, slight $CaCO^3$	
	15 to 40	10YR 4/4, clay loam, blocky and very compact, sandstone gravel, heavy $CaCO^3$	
	40 to 62	10YR 5/4, clay loam to clay, moderate blocky, sandstone gravel, moderate $CaCO^3$	
29	0 to 5	10YR 4/3, sod, loose silt loam, roots and organics, small sandstone gravel, slight $CaCO^3$	None
	5 to 14	10YR 4/3, silt loam to silty clay loam, weak to moderate blocky, roots, slight $CaCO^3$	
	14 to 45	10YR 4/4, clay loam, blocky and very compact, sandstone gravel, heavy $CaCO^3$	
	45 to 54	10YR 5/4, clay loam to clay, moderate blocky, sandstone gravel, moderate $CaCO^3$	

Average size 32.4 cm x 30.5 cm; Average depth 48. cm; Range 22 cm - 70 cm

Shovel Test Results, 5PE1800, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
1	0 to 2	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	2 to 18	10YR 4/4, fine sand, weak blocky, decomposed sandstone, roots, heavy $CaCO^3$	
	18 to 22	Platy, weathered sandstone	
2	0 to 2	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	2 to 22	10YR 4/4, fine sand, weak blocky, decomposed sandstone, less sandstone gravel, roots, heavy $CaCO^3$	
	22 to 27	Platy, weathered sandstone	
	27	Sandstone bedrock	
3	0 to 2	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	2 to 16	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	16 to 20	Platy, weathered sandstone	
	20	Sandstone bedrock	
4	0 to 3	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	3 to 24	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	24 to 28	Platy, weathered sandstone	
	28	Sandstone bedrock	
5	0 to 5	10YR 5/3, humus, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	5 to 23	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	23 to 27	Platy, weathered sandstone	
	27	Sandstone bedrock	
6	0 to 5	10YR 5/3, humus, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	5 to 14	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	14 to 35	10YR 5/4, fine sand with silt, weak structure, sandstone gravel, decomposing sandstone, heavy $CaCO^3$	
7	0 to 5	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	5 to 15	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	

Shovel Test Results, 5PE1800, FCMR.

Shovel Test No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
	15 to 30	10YR 5/4, fine sand with silt, weak structure, sandstone gravel, decomposing sandstone, heavy $CaCO^3$	
8	0 to 4	10YR 5/3, humus, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	4 to 13	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	13 to 25	10YR 5/4, fine sand with silt, weak structure, sandstone gravel, decomposing sandstone, heavy $CaCO^3$	
	25 to 29	Platy, weathered sandstone	
9	0 to 5	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	5 to 22	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	22 to 40	10YR 5/4, fine sand with silt, weak structure, sandstone gravel, decomposing sandstone, heavy $CaCO^3$	
	40	Sandstone bedrock	
10	0 to 5	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	5 to 17	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	17 to 25	Platy, weathered sandstone, mixed with stratum above	
11	0 to 5	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	5 to 20	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	20 to 34	10YR 5/4, fine sand with silt, weak structure, sandstone gravel, decomposing sandstone, heavy $CaCO^3$	
	34	Sandstone bedrock	
12	0 to 4	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	4 to 20	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	20 to 32	10YR 5/4, fine sand with silt, weak structure, sandstone gravel, decomposing sandstone, heavy $CaCO^3$	
	32	Platy, weathered sandstone, mixed with stratum above	
13	0 to 4	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	4 to 13	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	13 to 35	10YR 5/4, fine sand with silt, weak structure, sandstone gravel, decomposing sandstone, heavy $CaCO^3$	

Shovel Test Results, 5PE1800, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
14	0 to 8	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	8 to 18	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	18 to 71	10YR 5/4, fine sand with silt, weak structure, sandstone gravel, decomposing sandstone, heavy $CaCO^3$	
15	0 to 4	10YR 5/3, humus, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	4 to 12	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	12 to 22	10YR 5/4, fine sand with silt, weak structure, sandstone gravel, decomposing sandstone, heavy $CaCO^3$	
	22 to 27	Platy, weathered sandstone, mixed with stratum above	
	27	Sandstone bedrock	
16	0 to 3	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	3 to 10	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	10 to 17	10YR 5/4, fine sand with silt, weak structure, sandstone gravel, decomposing sandstone, heavy $CaCO^3$	
	17	Sandstone bedrock	
17	0 to 3	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	3 to 12	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	12 to 22	10YR 5/4, fine sand with silt, weak structure, sandstone gravel, decomposing sandstone, heavy $CaCO^3$	
	22	Sandstone bedrock	
18	0 to 3	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	3 to 12	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	12 to 28	10YR 5/4, fine sand with silt, weak structure, sandstone gravel, decomposing sandstone, heavy $CaCO^3$	
	28	Sandstone bedrock	
19	0 to 7	10YR 5/3, sod, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	7 to 20	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	20 to 32	10YR 5/4, fine sand with silt, weak structure, sandstone gravel, decomposing sandstone, heavy $CaCO^3$	
	32	Sandstone bedrock	

Shovel Test Results, 5PE1800, FCMR.

Shovel Test No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
20	0 to 6	10YR 5/3, humus, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	6 to 16	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	16 to 24	10YR 5/4, fine sand with silt, weak structure, sandstone gravel, decomposing sandstone, heavy $CaCO^3$	
	24	Compact sandstone gravel	
21	0 to 5	10YR 5/3, humus, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	5 to 14	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	14 to 24	10YR 5/4, fine sand with silt, weak structure, sandstone gravel, decomposing sandstone, heavy $CaCO^3$	
	24	Compact sandstone gravel	
22	0 to 3	10YR 4/4, humus, fine sand, weak blocky, decomposed sandstone, sandstone gravel, heavy $CaCO^3$	None
	3 to 11	10YR 5/4, fine sand with silt, weak structure, sandstone gravel, decomposing sandstone, heavy $CaCO^3$	
	11	Sandstone bedrock	
23	0 to 10	10YR 4/4, humus, fine sand, weak blocky, decomposed sandstone, sandstone gravel, heavy $CaCO^3$	None
	10	Compact sandstone gravel	
24	0 to 6	10YR 5/3, humus, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	6 to 14	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	14 to 25	10YR 5/4, fine sand with silt, weak structure, sandstone gravel, decomposing sandstone, heavy $CaCO^3$	
	25	Compact sandstone gravel	
25	0 to 4	10YR 5/3, humus, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	4 to 16	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	16	Sandstone bedrock	
26	0 to 3	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	3 to 21	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	21	Compact sandstone gravel	

Shovel Test Results, 5PE1800, FCMR.

Shovel Test No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
27	0 to 3	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	3 to 16	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	16	Compact sandstone gravel	
28	0 to 4	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	4 to 18	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	18 to 32	10YR 5/4, fine sand with silt, weak structure, sandstone gravel, decomposing sandstone, heavy $CaCO^3$	
29	0 to 4	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	4 to 20	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	20 to 37	10YR 5/4, fine sand with silt, weak structure, sandstone gravel, decomposing sandstone, heavy $CaCO^3$	
	37	Sandstone bedrock	
30	0 to 5	10YR 5/3, humus, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	5 to 25	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	25	Sandstone bedrock	
31	0 to 4	10YR 5/3, sod, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	0-5cm: 1 flake
	4 to 21	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	21	Sandstone bedrock	
32	0 to 4	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	4 to 17	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	17	Sandstone bedrock	
33	0 to 4	10YR 5/3, sod, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	4 to 16	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	16	Sandstone bedrock	

Shovel Test Results, 5PE1800, FCMR.

Shovel Test No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
34	0 to 5	10YR 5/3, sod, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	5 to 25	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	25	Sandstone bedrock	
35	0 to 3	10YR 5/3, sod, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	3 to 9	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	9 to 15	10YR 5/4, fine sand with silt, weak structure, sandstone gravel, decomposing sandstone, heavy $CaCO^3$	
	15	Sandstone bedrock	
36	0 to 4	10YR 5/3, sod, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	4 to 15	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	15	Compact sandstone gravel	
37	0 to 3	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	3 to 10	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	10	Sandstone bedrock	
38	0 to 4	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	4 to 18	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	18	Compact sandstone gravel	
39	0 to 3	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	3 to 10	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	10 to 20	10YR 5/4, fine sand with silt, weak structure, sandstone gravel, decomposing sandstone, heavy $CaCO^3$	
	20	Sandstone bedrock	
40	0 to 3	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	3 to 13	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	13	Sandstone bedrock	

Shovel Test Results, 5PE1800, FCMR.

Shovel Test No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
41	0 to 3	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	3 to 17	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	17	Sandstone bedrock	
42	0 to 3	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	3 to 15	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	15 to 25	10YR 5/4, fine sand with silt, weak structure, sandstone gravel, decomposing sandstone, heavy $CaCO^3$	
	25	Sandstone bedrock	
43	0 to 3	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	3 to 17	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	17	Sandstone bedrock	
44	0 to 3	10YR 5/3, silty sand, loose to weak structure, sandstone gravel on surface, roots, light $CaCO^3$	None
	3 to 9	10YR 4/4, fine sand, weak blocky, decomposed sandstone, sandstone gravel, roots, heavy $CaCO^3$	
	9 to 16	10YR 5/4, fine sand with silt, weak structure, sandstone gravel, decomposing sandstone, heavy $CaCO^3$	
	16	Sandstone bedrock	

Average size 32.2 cm x 30.5 cm; Average depth 24.3 cm; Range 10 cm - 71 cm

Shovel Test Results, 5PE1803, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
1	0 to 3	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	3 to 10	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	10 to 27	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	27	Large sandstone gravels	
2	0 to 3	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	3 to 9	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	9 to 22	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	22	Large sandstone gravels	
3	0 to 4	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	4 to 7	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	7	Sandstone bedrock	
4	0 to 4	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	4 to 11	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	11	Sandstone bedrock	
5	0 to 5	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	5 to 15	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	15	Large sandstone gravels	
6	0 to 5	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	5 to 20	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	20	Large sandstone gravels	
7	0 to 5	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	5 to 12	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	12 to 43	10YR 4/6, silty clay loam, moderate to weak blocky structure, increased decomposing sandstone and gravel, light $CaCO^3$	
	43	Large sandstone gravels	

Shovel Test Results, 5PE1803, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
8	0 to 4	10YR 5/3, humus, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	4 to 10	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	10 to 39	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	39	Sandstone bedrock	
9	0 to 4	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	4 to 13	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	13 to 45	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	45	Decomposing sandstone	
10	0 to 6	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	6 to 13	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	13 to 50	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	50	Sandstone bedrock	
11	0 to 4	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	4 to 14	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	14	Large sandstone gravels	
12	0 to 5	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	5 to 14	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	14	Large sandstone gravels	
13	0 to 5	10YR 5/3, humus, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	5 to 23	10YR 4/6, silty clay loam, moderate to weak blocky structure, increased sandstone gravel, light $CaCO^3$	
	23	Large sandstone gravels	
14	0 to 4	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	4 to 9	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	9 to 25	10YR 4/6, silty clay loam, moderate to weak blocky structure, increased sandstone gravel, light $CaCO^3$	

Shovel Test Results, 5PE1803, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
	25	Sandstone bedrock	
15	0 to 6	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	6 to 16	10YR 4/6, silty clay loam, moderate to weak blocky structure, increased sandstone gravel, light $CaCO^3$	
	16	Sandstone bedrock	
16	0 to 3	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	10-20cm: 2 flakes
	3 to 7	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	7 to 18	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	18	Large sandstone gravels	
17	0 to 3	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	3 to 12	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	12 to 31	10YR 4/6, silty clay loam, moderate to weak blocky structure, increased decomposing sandstone and gravel, light $CaCO^3$	
	31	Large sandstone gravels	
18	0 to 3	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	3 to 9	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	9 to 21	10YR 4/6, silty clay loam, moderate to weak blocky structure, increased decomposing sandstone and gravel, light $CaCO^3$	
	21	Large sandstone gravels	
19	0 to 3	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	3 to 10	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	10 to 23	10YR 4/6, silty clay loam, moderate to weak blocky structure, increased decomposing sandstone and gravel, light $CaCO^3$	
	23	Sandstone bedrock	
20	0 to 3	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	3 to 12	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	12 to 27	10YR 4/6, silty clay loam, moderate to weak blocky structure, increased decomposing sandstone and gravel, light $CaCO^3$	
	27	Sandstone bedrock	

Shovel Test Results, 5PE1803, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
21	0 to 4	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	4 to 12	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	12 to 32	10YR 4/6, silty clay loam, moderate to weak blocky structure, increased decomposing sandstone and gravel, light $CaCO^3$	
	32	Sandstone bedrock	
22	0 to 3	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	3 to 11	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	11 to 23	10YR 4/6, silty clay loam, moderate to weak blocky structure, increased decomposing sandstone and gravel, light $CaCO^3$	
	23	Sandstone bedrock	
23	0 to 3	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	3 to 9	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	9 to 19	10YR 4/6, silty clay loam, moderate to weak blocky structure, increased decomposing sandstone and gravel, light $CaCO^3$	
	19	Sandstone bedrock	
24	0 to 8	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	8	Sandstone bedrock	
25	0 to 8	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	8	Sandstone bedrock	
26	0 to 3	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	3	Sandstone bedrock	
27	0 to 5	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	5 to 13	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	13	Sandstone bedrock	
28	0 to 3	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	3 to 10	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	

Shovel Test Results, 5PE1803, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
	10 to 23	10YR 4/6, silty clay loam, moderate to weak blocky structure, increased decomposing sandstone and gravel, light $CaCO^3$	
	23	Sandstone bedrock	
29	0 to 4	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	4 to 15	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	15 to 36	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	36	Sandstone bedrock	
30	0 to 4	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	4 to 14	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	14 to 32	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	32 to 38	10YR 6/4, silty clay loam, weak blocky structure, caliche, heavy $CaCO^3$	
	38	Sandstone bedrock	
31	0 to 3	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	25-45cm: 1 flake
	3 to 8	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	8 to 29	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	29 to 44	10YR 6/4, silty clay loam, weak blocky structure, caliche, heavy $CaCO^3$	
	44	Sandstone bedrock	
32	0 to 4	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	4 to 12	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	12 to 48	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	48 to 57	10YR 6/4, silty clay loam, weak blocky structure, caliche, heavy $CaCO^3$	
	57	Sandstone bedrock	
33	0 to 4	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	4 to 15	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	15 to 45	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	45 to 62	10YR 6/4, silty clay loam, weak blocky structure, caliche, heavy $CaCO^3$	

Shovel Test Results, 5PE1803, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
	62	Sandstone bedrock	
34	0 to 3	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	3 to 12	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	12 to 36	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	36 to 52	10YR 6/4, silty clay loam, weak blocky structure, caliche, heavy $CaCO^3$	
	52	Sandstone bedrock	
35	0 to 3	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	0-20cm: 1 flake, 1 biface
	3 to 12	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	12 to 24	10YR 4/6, silty clay loam, moderate to weak blocky structure, increased decomposing sandstone and gravel, light $CaCO^3$	
	24	Sandstone bedrock	
36	0 to 4	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	4 to 10	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	10 to 35	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	35 to 52	10YR 6/4, silty clay loam, weak blocky structure, caliche, heavy $CaCO^3$	
	52	Large tree root	
37	0 to 3	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	3 to 12	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	12 to 44	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	44 to 66	10YR 6/4, silty clay loam, weak blocky structure, caliche, heavy $CaCO^3$	
	66	Sandstone bedrock	
38	0 to 3	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	3 to 12	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	12 to 55	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	55 to 70	10YR 6/4, silty clay loam, weak blocky structure, caliche, heavy $CaCO^3$	

Shovel Test Results, 5PE1803, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
39	0 to 4	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	4 to 14	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	14 to 52	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	52 to 69	10YR 6/4, silty clay loam, weak blocky structure, caliche, heavy $CaCO^3$	
40	0 to 4	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	4 to 14	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	14 to 32	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	32 to 34	10YR 6/4, silty clay loam, weak blocky structure, heavy caliche, heavy $CaCO^3$	
41	0 to 3	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	3 to 13	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	13 to 30	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	30 to 48	10YR 6/4, silty clay loam, weak blocky structure, caliche, heavy $CaCO^3$	
42	0 to 3	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	3 to 10	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	10 to 33	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	33 to 71	10YR 6/4, silty clay loam, weak blocky structure, caliche, heavy $CaCO^3$	
43	0 to 3	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	3 to 13	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	13 to 38	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	38 to 71	10YR 6/4, silty clay loam, weak blocky structure, caliche, heavy $CaCO^3$	
44	0 to 4	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	4 to 14	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	14 to 32	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	32 to 70	10YR 6/4, silty clay loam, weak blocky structure, caliche, heavy $CaCO^3$	

Shovel Test Results, 5PE1803, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
45	0 to 4	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	4 to 18	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	18 to 31	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	31 to 70	10YR 6/4, silty clay loam, weak blocky structure, caliche, heavy $CaCO^3$	
46	0 to 5	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	5 to 14	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	14 to 37	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	37 to 52	10YR 6/4, silty clay loam, weak blocky structure, caliche, heavy $CaCO^3$	
47	0 to 4	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	30-35cm: 1 flake
	4 to 13	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	13 to 43	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	43 to 56	10YR 6/4, silty clay loam, weak blocky structure, caliche, heavy $CaCO^3$	
48	0 to 4	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	4 to 13	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	13 to 33	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	33 to 38	10YR 6/4, silty clay loam, weak blocky structure, caliche, heavy $CaCO^3$	
49	0 to 3	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	3 to 15	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	15 to 39	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	39 to 50	10YR 6/4, silty clay loam, weak blocky structure, caliche, heavy $CaCO^3$	
50	0 to 5	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	5 to 14	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	14 to 31	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	31 to 40	10YR 6/4, silty clay loam, weak blocky structure, caliche, heavy $CaCO^3$	

Shovel Test Results, 5PE1803, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
51	0 to 6	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	6 to 16	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	16 to 36	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	36 to 42	10YR 6/4, silty clay loam, weak blocky structure, caliche, heavy $CaCO^3$	
52	0 to 4	10YR 5/3, loose fine silt with sand, organics, small sandstone gravels, no $CaCO^3$	None
	4 to 14	10YR 4/3, silty loam, weak blocky structure, roots, small sandstone gravels, no $CaCO^3$	
	14 to 29	10YR 4/6, silty clay loam, moderate to weak blocky structure, decomposing sandstone and gravel, light $CaCO^3$	
	29 to 41	10YR 6/4, silty clay loam, weak blocky structure, caliche, heavy $CaCO^3$	

Average size 31.6 cm; Average depth 36.4 cm; Range in depth 3 cm - 71 cm

Shovel Test Results, 5PE1804, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
1	0 to 2	10YR 5/3, fine silty sand, loose top soil with organics, roots, light to moderate $CaCO^3$	None
	2 to 14	10YR 4/4, fine sand with silt, weak blocky, roots, moderate $CaCO^3$	
	14 to 34	10YR 5/4, silty loam with sand, moderate blocky, compact, sandstone gravel, roots, moderate $CaCO^3$	
	34	Sandstone gravel	
2	0 to 5	10YR 5/3, sod, fine silty sand, loose top soil with organics, roots, light to moderate $CaCO^3$	None
	5 to 25	10YR 4/4, fine sand with silt, weak blocky, roots, moderate $CaCO^3$	
	25 to 45	10YR 5/4, silty loam with sand, moderate blocky, compact, sandstone gravel, roots, moderate $CaCO^3$	
	45 to 72	10YR 4/4, silty loam with fine sand, weak blocky, compact, less gravel, heavy $CaCO^3$	
3	0 to 4	10YR 5/3, fine silty sand, loose top soil with organics, roots, light to moderate $CaCO^3$	None
	4 to 18	10YR 4/4, fine sand with silt, weak blocky, roots, moderate $CaCO^3$	
	18 to 42	10YR 5/4, silty loam with sand, moderate blocky, compact, sandstone gravel, roots, moderate $CaCO^3$	
	42 to 69	10YR 4/4, silty loam with fine sand, weak blocky, compact, less gravel, heavy $CaCO^3$	
4	0 to 7	10YR 5/3, sod, fine silty sand, loose top soil with organics, roots, light to moderate $CaCO^3$	None
	7 to 24	10YR 4/4, fine sand with silt, weak blocky, roots, moderate $CaCO^3$	
	24 to 48	10YR 5/4, silty loam with sand, moderate blocky, compact, sandstone gravel, roots, moderate $CaCO^3$	
	48 to 72	10YR 4/4, silty loam with fine sand, weak blocky, compact, less gravel, heavy $CaCO^3$	
5	0 to 4	10YR 5/3, fine silty sand, loose top soil with organics, roots, light to moderate $CaCO^3$	None
	4 to 11	10YR 4/4, fine sand with silt, weak blocky, roots, moderate $CaCO^3$	
	11 to 24	10YR 5/4, silty loam with sand, moderate blocky, compact, sandstone gravel, roots, moderate $CaCO^3$	
	24	Very compact decomposing sandstone	
6	0 to 4	10YR 5/3, fine silty sand, loose top soil with organics, roots, light to moderate $CaCO^3$	None
	4 to 16	10YR 4/4, fine sand with silt, weak blocky, roots, moderate $CaCO^3$	
	16 to 31	Decomposing sandstone mixed with stratum above	
7	0 to 5	10YR 5/3, sod, fine silty sand, loose top soil with organics, roots, light to moderate $CaCO^3$	None
	5 to 24	10YR 4/4, fine sand with silt, weak blocky, roots, moderate $CaCO^3$	
	24 to 46	10YR 5/4, silty loam with sand, moderate blocky, compact, sandstone gravel, roots, moderate $CaCO^3$	
	46	Sandstone bedrock	

Shovel Test Results, 5PE1804, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
8	0 to 4	10YR 5/3, fine silty sand, loose top soil with organics, roots, light to moderate $CaCO^3$	None
	4 to 20	10YR 4/4, fine sand with silt, weak blocky, roots, moderate $CaCO^3$	
	20	Sandstone bedrock	
9	0 to 5	10YR 5/3, fine silty sand, loose top soil with organics, roots, light to moderate $CaCO^3$	None
	5 to 26	10YR 4/4, fine sand with silt, weak blocky, roots, moderate $CaCO^3$	
	26 to 71	10YR 5/4, silty loam with sand, moderate blocky, compact, sandstone gravel, roots, moderate $CaCO^3$	
10	0 to 9	10YR 5/3, humus, fine silty sand, loose top soil with organics, roots, light to moderate $CaCO^3$	None
	9 to 23	10YR 4/4, fine sand with silt, weak blocky, roots, moderate $CaCO^3$	
11	0 to 6	10YR 5/3, sod, fine silty sand, loose top soil with organics, roots, light to moderate $CaCO^3$	None
	6 to 20	10YR 4/4, fine sand with silt, weak blocky, roots, moderate $CaCO^3$	
	20 to 36	10YR 5/4, silty loam with sand, moderate blocky, compact, sandstone gravel, roots, moderate $CaCO^3$	
	36	Very compact decomposing sandstone	
12	0 to 7	10YR 5/3, sod, fine silty sand, loose top soil with organics, roots, light to moderate $CaCO^3$	None
	7 to 21	10YR 4/4, fine sand with silt, weak blocky, roots, moderate $CaCO^3$	
	21 to 31	10YR 5/4, silty loam with sand, moderate blocky, compact, sandstone gravel, roots, moderate $CaCO^3$	
	31	Very compact decomposing sandstone	
13	0 to 6	10YR 5/3, sod, fine silty sand, loose top soil with organics, roots, light to moderate $CaCO^3$	None
	6 to 22	10YR 4/4, fine sand with silt, weak blocky, roots, moderate $CaCO^3$	
	22	Sandstone bedrock	
14	0 to 5	10YR 5/3, fine silty sand, loose top soil with organics, roots, light to moderate $CaCO^3$	0-10cm: 1 flake
	5 to 22	10YR 4/4, fine sand with silt, weak blocky, roots, moderate $CaCO^3$	
	22 to 40	10YR 5/4, silty loam with sand, moderate blocky, compact, sandstone gravel, roots, moderate $CaCO^3$	
	40	Very compact decomposing sandstone	
15	0 to 4	10YR 5/3, fine silty sand, loose top soil with organics, roots, light to moderate $CaCO^3$	None
	4 to 19	10YR 4/4, fine sand with silt, weak blocky, roots, moderate $CaCO^3$	
	19 to 31	10YR 5/4, silty loam with sand, moderate blocky, compact, sandstone gravel, roots, moderate $CaCO^3$	

Shovel Test Results, 5PE1804, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
	31	Very compact decomposing sandstone	

Average size 32.5 cm x 30.2 cm; Average Depth 41.5 cm; Range 20 cm - 72 cm

Shovel Test Results, 5PE1805, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
1	0 to 5	10YR 5/3, sod, loose, fine sand, roots, light $CaCO^3$	None
	5 to 22	10YR 4/3, fine sand, weak blocky structure, roots, small sandstone gravels, light $CaCO^3$	
	22 to 45	10YR 4/4, sandy loam, moderate blocky structure, roots, increase in small sandstone gravels, moderate $CaCO^3$	
	45 to 64	10YR 4/6, silty loam with sand, moderate blocky structure, very compact, decomposing sandstone increases with depth, heavy $CaC0^3$	
2	0 to 4	10YR 5/3, sod, loose, fine sand, roots, light $CaCO^3$	None
	4 to 16	10YR 4/3, fine sand, weak blocky structure, roots, small sandstone gravels, light $CaCO^3$	
	16 to 32	10YR 4/4, sandy loam, moderate blocky structure, roots, increase in small sandstone gravels, moderate $CaCO^3$	
	32 to 41	10YR 4/6, silty loam with sand, moderate blocky structure, very compact, decomposing sandstone increases with depth, heavy $CaC0^3$	
3	0 to 5	10YR 5/3, sod, loose, fine sand, roots, light $CaCO^3$	None
	5 to 19	10YR 4/3, fine sand, weak blocky structure, roots, small sandstone gravels, light $CaCO^3$	
	19	Sandstone boulder	
4	0 to 4	10YR 5/3, sod, loose, fine sand, roots, light $CaCO^3$	None
	4 to 19	10YR 4/3, fine sand, weak blocky structure, roots, small sandstone gravels, light $CaCO^3$	
	19	Sandstone boulder	
5	0 to 5	10YR 5/3, sod, loose, fine sand, roots, light $CaCO^3$	None
	5 to 18	10YR 4/3, fine sand, weak blocky structure, roots, small sandstone gravels, light $CaCO^3$	
	18 to 44	10YR 4/4, sandy loam, moderate blocky structure, roots, increase in small sandstone gravels, moderate $CaCO^3$	
	44	Sandstone boulder	
6	0 to 5	10YR 5/3, sod, loose, fine sand, roots, light $CaCO^3$	0-20cm: 1 flake
	5 to 16	10YR 4/3, fine sand, weak blocky structure, roots, small sandstone gravels, light $CaCO^3$	
	16 to 28	10YR 4/4, sandy loam, moderate blocky structure, roots, increase in small sandstone gravels, moderate $CaCO^3$	
	28 to 38	10YR 4/6, silty loam with sand, moderate blocky structure, very compact, decomposing sandstone, heavy $CaCO^3$	
	38	Sandstone boulder	

Shovel Test Results, 5PE1805, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
7	0 to 5	10YR 5/3, sod, loose, fine sand, roots, light $CaCO^3$	None
	5 to 15	10YR 4/3, fine sand, weak blocky structure, roots, small sandstone gravels, light $CaCO^3$	
	15 to 32	10YR 4/4, sandy loam, moderate blocky structure, roots, increase in small sandstone gravels, moderate $CaCO^3$	
	32	Large tree root	
8	0 to 4	10YR 5/3, sod, loose, fine sand, roots, light $CaCO^3$	
	4 to 19	10YR 4/3, fine sand, weak blocky structure, roots, small sandstone gravels, light $CaCO^3$	None
	19 to 43	10YR 4/4, sandy loam, moderate blocky structure, roots, very compact, increase in small sandstone gravels, moderate $CaC0^3$	
	43 to 58	10YR 4/6, silty loam with sand, moderate blocky structure, very compact, decomposing sandstone, heavy $CaCO^3$	
	58 to 75	10YR 6/4, fine silty loam, moderate blocky structure, less compact, heavy $CaCO^3$	
9	0 to 4	10YR 5/3, sod, loose, fine sand, roots, light $CaCO^3$	
	4 to 18	10YR 4/3, fine sand, weak blocky structure, roots, small sandstone gravels, light $CaCO^3$	None
	18 to 42	10YR 4/6, silty loam with sand, moderate blocky structure, very compact, decomposing sandstone increases with depth, heavy $CaC0^3$	
10	0 to 3	10YR 5/3, sod, loose, fine sand, roots, light $CaCO^3$	
	3 to 15	10YR 4/3, fine sand, weak blocky structure, roots, small sandstone gravels, light $CaCO^3$	None
	15 to 27	10YR 4/6, silty loam with sand, moderate blocky structure, extremely compact, decomposing sandstone increases with depth, heavy $CaC0^3$	
11	0 to 5	10YR 5/3, sod, loose, fine sand, roots, light $CaCO^3$	
	5 to 19	10YR 4/3, fine sand, weak blocky structure, roots, small sandstone gravels, light $CaCO^3$	None
	19 to 69	10YR 4/6, silty loam with sand, moderate blocky structure, very compact, decomposing sandstone, heavy $CaCO^3$	
12	0 to 7	10YR 5/3, sod, loose, fine sand, roots, light $CaCO^3$	
	7 to 23	10YR 4/3, fine sand, weak blocky structure, roots, small sandstone gravels, light $CaCO^3$	
	23 to 48	10YR 4/4, sandy loam, moderate blocky structure, increase in small sandstone gravels, moderate $CaCO^3$	None
	48	Weathered sandstone bedrock	

Shovel Test Results, 5PE1805, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
13	0 to 6	10YR 5/3, sod, loose, fine sand, roots, light $CaCO^3$	None
	6 to 16	10YR 4/3, fine sand, weak blocky structure, roots, small sandstone gravels, light $CaCO^3$	
	16 to 30	10YR 4/6, silty loam with sand, moderate blocky structure, very compact, decomposing sandstone, heavy $CaCO^3$	
	30	Decomposing sandstone	
14	0 to 6	10YR 5/3, sod, loose, fine sand, roots, light $CaCO^3$	None
	6 to 17	10YR 4/3, fine sand, weak blocky structure, roots, small sandstone gravels, light $CaCO^3$	
	17 to 32	10YR 4/6, silty loam with sand, moderate blocky structure, very compact, decomposing sandstone, heavy $CaCO^3$	
	32	Sandstone boulder	
15	0 to 4	10YR 5/3, sod, loose, fine sand, roots, light $CaCO^3$	None
	4 to 17	10YR 4/3, fine sand, weak blocky structure, roots, small sandstone gravels, light $CaCO^3$	
	17 to 25	10YR 4/6, silty loam with sand, moderate blocky structure, very compact, decomposing sandstone, heavy $CaCO^3$	
	25	Sandstone boulder	
16	0 to 5	10YR 5/3, sod, loose, fine sand, roots, light $CaCO^3$	None
	5 to 14	10YR 4/3, fine sand, weak blocky structure, roots, small sandstone gravels, light $CaCO^3$	
	14 to 30	10YR 4/6, silty loam with sand, moderate blocky structure, very compact, decomposing sandstone, heavy $CaCO^3$	
	30	Decomposing sandstone	
17	0 to 5	10YR 5/3, sod, loose, fine sand, roots, light $CaCO^3$	None
	5 to 13	10YR 4/3, fine sand, weak blocky structure, roots, small sandstone gravels, light $CaCO^3$	
	13 to 20	10YR 4/6, silty loam with sand, moderate blocky structure, very compact, decomposing sandstone, heavy $CaCO^3$	
	20	Large sandstone gravels	
18	0 to 5	10YR 5/3, sod, loose, fine sand, roots, light $CaCO^3$	0-5cm: 1 flake
	5 to 14	10YR 4/3, fine sand, weak blocky structure, roots, small sandstone gravels, light $CaCO^3$.	
	14 to 23	10YR 4/6, silty loam with sand, moderate blocky structure, very compact, decomposing sandstone, heavy $CaCO^3$	
	23	Sandstone boulder	
19	0 to 5	10YR 5/3, sod, loose, fine sand, roots, light $CaCO^3$	0-5cm: 1 flake

Shovel Test Results, 5PE1805, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
	5 to 14	10YR 4/3, fine sand, weak blocky structure, roots, small sandstone gravels, light $CaCO^3$	
	14 to 18	10YR 4/6, silty loam with sand, moderate blocky structure, very compact, decomposing sandstone, heavy $CaCO^3$	
	18	Large sandstone gravels	
20	0 to 5	10YR 5/3, sod, loose, fine sand, roots, light $CaCO^3$	0-10cm: 1 utilized flake
	5 to 12	10YR 4/3, fine sand, weak blocky structure, roots, small sandstone gravels, light $CaCO^3$	
	12 to 32	10YR 4/6, silty loam with sand, moderate blocky structure, very compact, less decomposing sandstone, heavy $CaCO^3$	
	32	Large sandstone gravels	
21	0 to 4	10YR 5/3, sod, loose, fine sand, roots, light $CaCO^3$	None
	4 to 13	10YR 4/3, fine sand, weak blocky structure, roots, small sandstone gravels, light $CaCO^3$	
	13 to 36	10YR 6/4, silty loam, moderate blocky structure, very compact, heavy decomposing sandstone, heavy $CaCO^3$	
22	0 to 5	10YR 5/3, sod, loose, fine sand, roots, light $CaCO^3$	None
	5 to 16	10YR 4/3, fine sand, weak blocky structure, roots, small sandstone gravels, light $CaCO^3$	
	16 to 39	10YR 4/6, silty loam with sand, moderate blocky structure, very compact by base, decomposing sandstone, heavy $CaCO^3$	
23	0 to 4	10YR 5/3, sod, loose, fine sand, roots, light $CaCO^3$	None
	4 to 15	10YR 4/3, fine sand, weak blocky structure, roots, small sandstone gravels, light $CaCO^3$	
	15 to 31	10YR 4/6, silty loam with sand, moderate blocky structure, very compact by base, decomposing sandstone, heavy $CaCO^3$	
24	0 to 6	10YR 5/3, sod, loose, fine sand, roots, light $CaCO^3$	None
	6 to 18	10YR 4/3, fine sand, weak blocky structure, roots, small sandstone gravels, light $CaCO^3$	
	18 to 29	10YR 4/6, silty loam with sand, moderate blocky structure, very compact by base, decomposing sandstone, heavy $CaCO^3$	
25	0 to 4	10YR 5/3, sod, loose, fine sand, roots, light $CaCO^3$	None
	4 to 16	10YR 4/3, fine sand, weak blocky structure, roots, small sandstone gravels, light $CaCO^3$	
	16 to 36	10YR 4/6, silty loam with sand, moderate blocky structure, very compact by base, decomposing sandstone, heavy $CaCO^3$	

Average size 30.5 cm to 32 cm; Average depth 36 cm; Range in depth 18 cm to 75 cm

Shovel Test Results, 5PE1807, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
1	0 to 4	10YR 5/3, loose, fine sand, no $CaCO^3$	None
	4 to 15	10YR 5/2, loamy sand, weak subangular blocky, roots, no $CaCO^3$	
	15 to 39	10YR 4/4, loamy sand, moderate subangular blocky, very compact, roots, no $CaCO^3$	
	39 to 71	10YR 5/3, loamy sand, moderate subangular blocky, compact, few roots, light to moderate $CaCO^3$	
2	0 to 6	10YR 5/3, loose, fine sand with silt, no $CaCO^3$	5-21cm: 1 flake, 1 core fragment
	6 to 40	10YR 4/1, silty loam, moderate subangular blocky, roots, no $CaCO^3$	
3	0 to 4	10YR 5/3, loose, fine sand with silt, no $CaCO^3$	10-25cm: 1 flake
	4 to 27	10YR 4/1, silty loam, moderate subangular blocky, roots, no $CaCO^3$	
	27 to 37	10YR 4/4, sandy clay loam, moderate subangular blocky, very compact, roots, no $CaCO^3$	
	37 to 70	10YR 4/3, sandy loam, moderate subangular blocky, roots, no $CaCO^3$	
4	0 to 9	10YR 5/3, loose, fine sand with silt, no $CaCO^3$	30-40cm: 1 flake
	9 to 42	10YR 4/1, silty loam, moderate subangular blocky, roots, no $CaCO^3$	
	42 to 71	10YR 3/3, sandy loam, moderate subangular blocky, charcoal, roots, no $CaCO^3$	
5	0 to 6	10YR 5/3, loose, fine sand with silt, no $CaCO^3$	surface: 1 flake;
	6 to 38	10YR 4/1, silty loam, moderate subangular blocky, roots, no $CaCO^3$	5-20cm: 1 flake;
	38 to 68	10YR 4/3, sandy loam, moderate subangular blocky, roots, no $CaCO^3$	20-30cm: 1 flake;
	68	Tabular sandstone bedrock	30-40cm: 2 flakes, 1 retouched flake
6	0 to 6	10YR 5/3, loose, fine sand with silt, no $CaCO^3$	0-10cm: 1 flake, rodent bones;
	6 to 22	10YR 3/4, fine sand with silt, weak subangular blocky, organics, roots, no $CaCO^3$	10-20cm: 4 flakes
	22 to 40	10YR 4/3, sandy loam, moderate subangular blocky, roots, no $CaCO^3$	
	40	Sandstone boulder which begins at 13cm	
7	0 to 5	10YR 5/3, loose, fine sand with silt, no $CaCO^3$	0-10cm: 1 flake
	5 to 20	10YR 3/4, fine sand with silt, weak subangular blocky, organics, roots, no $CaCO^3$	

Shovel Test Results, 5PE1807, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
	20 to 41	10YR 4/3, sandy loam, moderate subangular blocky, roots, no $CaCO^3$	
	41	Sloping tabular sandstone boulder	
8	0 to 6	10YR 5/3, loose, fine sand with silt, no $CaCO^3$	None
	6 to 23	10YR 3/4, fine sand with silt, weak subangular blocky, organics, roots, no $CaCO^3$	
	23 to 70	10YR 4/3, sandy loam, moderate subangular blocky, roots, no $CaCO^3$	
9	0 to 6	10YR 5/3, loose, fine sand with silt, no $CaCO^3$	surface: 1 flake
	6 to 12	10YR 5/2, fine sand with silt, weak subangular blocky, roots, no $CaCO^3$	
	12 to 24	10YR 5/2, clay loam, moderate subangular blocky, sandstone cobbles at upper boundary, light to moderate $CaCO^3$	
		Average size 33.6 cm x 31.8 cm; Average depth 55 cm; Depth Range 24 cm - 71 cm	

Shovel Test Results, 5PE1809, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
1	0 to 3	10YR 5/3, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	3 to 9	10YR 4/4, fine sand with silt, weak structure, roots, moderate $CaCO^3$	
	9 to 23	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, moderate $CaCO^3$	
	23	Large pieces of tabular sandstone	
2	0 to 2	10YR 4/4, fine sand with silt, weak structure, roots, moderate $CaCO^3$	None
	2 to 6	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, moderate $CaCO^3$	
	6	Sandstone bedrock	
3	0 to 2	10YR 5/3, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	2 to 6	10YR 4/4, fine sand with silt, weak structure, roots, moderate $CaCO^3$	
	6 to 12	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, moderate $CaCO^3$	
	12	Large tabular sandstone slab	
4	0 to 5	10YR 5/3, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	5 to 25	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, moderate $CaCO^3$	
	25	Sandstone bedrock	
5	0 to 10	10YR 5/3, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	10 to 32	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, moderate $CaCO^3$	
	32	Sandstone bedrock	
6	0 to 9	10YR 5/3, humus, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	9 to 31	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, moderate $CaCO^3$	
	31	Sandstone bedrock	
7	Surface	Sandstone bedrock	None
8	0 to 14	10YR 5/3, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	14 to 39	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, sandstone gravels, moderate $CaCO^3$	

Shovel Test Results, 5PE1809, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
	39	Decomposing sandstone stratum	
9	0 to 8	10YR 5/3, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	8 to 22	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, sandstone gravels, moderate $CaCO^3$	
	22	Sandstone bedrock	
10	0 to 5	10YR 5/3, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	5 to 14	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, moderate $CaCO^3$	
	14	Sandstone gravel stratum	
11	0 to 7	10YR 5/3, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	7	Large tabular pieces of sandstone	
12	0 to 3	10YR 5/3, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	3 to 11	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, moderate $CaCO^3$	
	11	Large tabular pieces of sandstone	
13	0 to 5	10YR 5/3, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	5 to 9	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, moderate $CaCO^3$	
	9	Sandstone bedrock	
14	0 to 7	10YR 5/3, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	7 to 14	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, moderate $CaCO^3$	
	14	Large tabular pieces of sandstone	
15	0 to 7	10YR 5/3, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	7 to 21	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, moderate $CaCO^3$	
	21	Large tabular pieces of sandstone	

Shovel Test Results, 5PE1809, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
16	0 to 6	10YR 5/3, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	6 to 16	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, sandstone gravels, moderate $CaCO^3$	
	16	Large tabular pieces of sandstone	
17	0 to 4	10YR 5/3, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	4 to 12	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, moderate $CaCO^3$	
	12	Large sandstone boulder	
18	0 to 4	10YR 5/3, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	4 to 30	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, sandstone gravels, moderate $CaCO^3$	
	30	Sandstone bedrock	
19	0 to 9	10YR 5/3, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	9 to 26	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, moderate $CaCO^3$	
	26	Large sandstone boulder	
20	0 to 12	10YR 5/3, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	12 to 35	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, moderate $CaCO^3$	
	35	Sandstone bedrock	
21	0 to 9	10YR 5/3, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	9 to 29	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, sandstone gravels, moderate $CaCO^3$	
	29	Sandstone bedrock	
22	0 to 8	10YR 5/3, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	8 to 20	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, moderate $CaCO^3$	

Shovel Test Results, 5PE1809, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
	20	Sandstone bedrock	
23	Surface	Sandstone bedrock	None
24	0 to 9	10YR 5/3, humus, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	9 to 19	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, moderate $CaCO^3$	
	19	Sandstone gravel stratum	
25	0 to 8	10YR 5/3, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	8 to 17	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, sandstone gravels, moderate $CaCO^3$	
	17	Large tabular pieces of sandstone	
26	0 to 11	10YR 5/3, humus, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	11 to 42	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, moderate $CaCO^3$	
	42	Sandstone gravel stratum	
27	0 to 5	10YR 5/3, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	5 to 13	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, sandstone gravels, moderate $CaCO^3$	
	13	Large tabular pieces of sandstone	
28	0 to 6	10YR 5/3, humus, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	6 to 15	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, moderate $CaCO^3$	
	15	Sandstone gravel stratum	
29	0 to 5	10YR 5/3, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None
	5	Sandstone bedrock	
30	0 to 7	10YR 5/3, loose, fine sand with silt, sandstone gravels, roots, light $CaCO^3$	None

Shovel Test Results, 5PE1809, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
	7 to 12	10YR 5/4, fine sand with silt, moderate subangular blocky, more compact, less roots, moderate $CaCO^3$	
	12	Sandstone bedrock	

Average size 31.3 cm x 29.6 cm; Average depth 19.9 cm; Depth range 0 cm to 42 cm

Shovel Test Results, 5PE1812, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
1	0 to 5	10YR 3/1, humus, loose loam, no $CaCO^3$	None
	5 to 7	10YR 6/4, sandy clay loam, weak angular blocky, no $CaCO^3$	
	7	Colluvial sandstone gravels	
2	0 to 10	10YR 6/4, loose sandy loam, heavy $CaCO^3$	None
	10	Colluvial sandstone gravels	
3	0 to 8	10YR 3/1, loose loamy sand, organics, no $CaCO^3$	None
	8 to 28	10YR 5/3, loamy sand, weak subangular blocky, no $CaCO^3$	
4	0 to 9	10YR 7/2, loose sand, slight $CaCO^3$	None
	9	Colluvial sandstone gravels	
5	0 to 7	10YR 3/1, humus, loose sandy loam, no $CaCO^3$	None
	7 to 19	10YR 6/4, sandy loam, weak structure, slight $CaCO^3$	
	19	Colluvial sandstone gravels	
6	0 to 7	10YR 5/3, loose loam, no $CaCO^3$	None
	7	Colluvial sandstone gravels	
7	0 to 14	10YR 3/2, humus, loose sandy loam, no $CaCO^3$	None
	14 to 27	10YR 5/3, loamy sand, weak subangular blocky, moderate $CaCO^3$	
	27	Colluvial sandstone gravels	
8	0 to 2	10YR 3/1, humus, loose sandy loam, no $CaCO^3$	None
	2 to 17	10YR 5/3, loamy sand, weak subangular blocky, moderate $CaCO^3$	
	17	Colluvial sandstone gravels	
9	0 to 10	10YR 4/1, loose loam, organics, moderate $CaCO^3$	None
	10 to 28	10YR 5/3, silty clay loam, weak subangular blocky, heavy $CaCO^3$	

Shovel Test Results, 5PE1812, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
	28 to 45	10YR 6/3, sandy clay, moderate angular blocky, heavy $CaCO^3$	
	45 to 58	Light green (no Munsel match), massive clay, heavy $CaCO^3$	
10	0 to 5	10YR 3/1, humus, loose sandy loam, slight $CaCO^3$	None
	5 to 18	10YR 4/3, sandy loam, weak structure, heavy $CaCO^3$	
	18	Colluvial sandstone gravels	
11	0 to 20	10YR 7/2, loose sand wih scat and organics, moderate $CaCO^3$	None
	20	Sandstone bedrock at base of shelter	

Average size 28 cm x 28 cm; Average depth 20 cm; Range 7 cm to 58 cm

Shovel Test Results, 5PE1813, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
1	0 to 7	10YR 5/3, loose sand with silt, organics, roots, sandstone gravels, light $CaCO^3$	None
	7 to 24	10YR 5/4, loose silty loam with sand, decomposing sandstone and gravels, moderate $CaCO^3$	
	24	Decomposing sandstone	
2	0 to 4	10YR 5/3, loose sand with silt, organics, roots, sandstone gravels, light $CaCO^3$	None
	4 to 8	10YR 4/3, silty loam, weak subangular blocky, roots, moderate $CaCO^3$	
	8 to 16	10YR 6/3, silty loam, loose but compact, decomposing sandstone, heavy $CaCO^3$	
	16	Decomposing sandstone and tabular sandstone	
3	0 to 6	10YR 5/3, loose sand with silt, organics, roots, sandstone gravels, light $CaCO^3$	None
	6 to 16	10YR 4/3, silty loam, weak subangular blocky, roots, moderate $CaCO^3$	
	16 to 25	10YR 6/3, silty loam, loose but compact, decomposing sandstone, heavy $CaCO^3$	
	25	Sandstone bedrock	
4	0 to 5	10YR 5/3, loose sand with silt, organics, roots, sandstone gravels, light $CaCO^3$	0-15cm: 1 flake
	5 to 16	10YR 4/3, silty loam, weak subangular blocky, roots, moderate $CaCO^3$	
	16	Sandstone bedrock	
5	0 to 6	10YR 5/3, loose sand with silt, organics, roots, sandstone gravels, light $CaCO^3$	None
	6 to 17	10YR 4/3, silty loam, weak subangular blocky, roots, moderate $CaCO^3$	
	17 to 46	10YR 6/3, silty loam, weak subangular blocky, compact, decomposing sandstone increasing with depth, heavy $CaCO^3$	
	46	Large sandstone gravels	
6	0 to 4	10YR 5/3, loose sand with silt, organics, roots, sandstone gravels, light $CaCO^3$	None
	4 to 23	10YR 5/3, silty loam, moderate subangular blocky, roots, moderate $CaCO^3$	
	23 to 69	10YR 6/3, silty loam, weak subangular blocky, compact, decreasing decomposing sandstone, heavy $CaCO^3$	
7	0 to 6	10YR 5/3, loose sand with silt, organics, roots, sandstone gravels, light $CaCO^3$	None
	6 to 24	10YR 5/3, silty loam, moderate subangular blocky, roots, moderate $CaCO^3$	

Shovel Test Results, 5PE1813, FCMR.

Shovel No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
	24 to 57	10YR 6/3, silty loam, weak subangular blocky, compact, decreasing decomposing sandstone, heavy $CaCO^3$	
	57 to 70	10YR 6/6, fine silty loam with sand, loose to weak blocky, a few sandstone gravels, moderate $CaCO^3$	
8	0 to 7	10YR 5/3, loose sand with silt, organics, roots, sandstone gravels, light $CaCO^3$	None
	7 to 18	10YR 5/3, silty loam, moderate subangular blocky, roots, moderate $CaCO^3$	
	18 to 42	10YR 5/4, silty loam, weak subangular blocky, very compact, decomposing sandstone, heavy $CaCO^3$	
	42 to 71	10YR 6/6, fine silty loam with sand, loose to weak blocky, a few sandstone gravels, moderate $CaCO^3$	
9	0 to 8	10YR 5/3, loose sand with silt, organics, roots, sandstone gravels, light $CaCO^3$	None
	8 to 28	10YR 5/3, silty loam, moderate subangular blocky, roots, moderate $CaCO^3$	
	28 to 72	10YR 5/4, silty loam, weak subangular blocky, very compact, decomposing sandstone, heavy $CaCO^3$	
10	0 to 7	10YR 5/3, loose sand with silt, organics, roots, sandstone gravels, light $CaCO^3$	None
	7 to 24	10YR 5/3, silty loam, moderate subangular blocky, roots, moderate $CaCO^3$	
	24 to 70	10YR 5/4, silty loam, weak subangular blocky, compact, decomposing sandstone, heavy $CaCO^3$	
11	0 to 6	10YR 5/3, loose sand with silt, organics, roots, sandstone gravels, light $CaCO^3$	None
	6 to 17	10YR 5/3, silty loam, moderate subangular blocky, roots, moderate $CaCO^3$	
	17 to 71	10YR 5/4, silty loam, weak subangular blocky, compact, decomposing sandstone, heavy $CaCO^3$	
12	0 to 6	10YR 5/3, loose sand with silt, organics, roots, sandstone gravels, light $CaCO^3$	None
	6 to 20	10YR 5/3, silty loam, moderate subangular blocky, roots, moderate $CaCO^3$	
	20 to 65	10YR 5/4, silty loam, weak subangular blocky, compact, decomposing sandstone, heavy $CaCO^3$	
13	0 to 5	10YR 5/3, loose sand with silt, organics, roots, sandstone gravels, light $CaCO^3$	None
	5	Large sandstone gravels	
14	0 to 6	10YR 5/3, loose sand with silt, organics, roots, sandstone gravels, light $CaCO^3$	None
	6 to 14	10YR 5/3, silty loam, moderate subangular blocky, roots, moderate $CaCO^3$	
	14 to 70	10YR 5/4, silty loam, weak subangular blocky, compact, decomposing sandstone, heavy $CaCO^3$	

Shovel Test Results, 5PE1813, FCMR.

Shovel Test No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
15	0 to 5	10YR 5/3, loose sand with silt, organics, roots, sandstone gravels, light $CaCO^3$	None
	5 to 16	10YR 5/3, silty loam, moderate subangular blocky, roots, moderate $CaCO^3$	
	16 to 54	10YR 5/4, silty loam, weak subangular blocky, very compact, decomposing sandstone, heavy $CaCO^3$	
	54 to 71	10YR 6/6, fine silty loam with sand, loose to weak blocky, a few sandstone gravels, moderate $CaCO^3$	
16	0 to 6	10YR 5/3, loose sand with silt, organics, roots, sandstone gravels, light $CaCO^3$	None
	6 to 21	10YR 5/3, silty loam, moderate subangular blocky, roots, moderate $CaCO^3$	
	21 to 68	10YR 5/4, silty loam, weak subangular blocky, very compact, decomposing sandstone, heavy $CaCO^3$	
17	0 to 8	10YR 5/3, loose sand with silt, organics, roots, sandstone gravels, light $CaCO^3$	None
	8 to 24	10YR 5/3, silty loam, moderate angular blocky, sandstone gravels, roots, heavy $CaCO^3$	
	24 to 65	10YR 5/4, silty loam, weak subangular blocky, very compact, decomposing sandstone, heavy $CaCO^3$	
18	0 to 8	10YR 5/3, loose sand with silt, organics, roots, sandstone gravels, light $CaCO^3$	None
	8 to 39	10YR 5/3, silty loam, moderate angular blocky, sandstone gravels, roots, heavy $CaCO^3$	
	39 to 70	10YR 5/4, silty loam, weak subangular blocky, very compact, decomposing sandstone, heavy $CaCO^3$	
19	0 to 9	10YR 5/3, loose sand with silt, organics, roots, sandstone gravels, light $CaCO^3$	0-10cm: 1 flake
	9 to 30	10YR 5/4, silty loam, weak subangular blocky, very compact, decomposing sandstone, heavy $CaCO^3$	
20	0 to 10	10YR 5/3, loose sand with silt, organics, roots, sandstone gravels, light $CaCO^3$	None
	10 to 37	10YR 5/4, silty loam, weak subangular blocky, very compact, decomposing sandstone, large sandstone gravels, heavy $CaCO^3$	
21	0 to 10	10YR 5/3, loose sand with silt, organics, roots, sandstone gravels, light $CaCO^3$	None
	10 to 28	10YR 5/4, silty loam, weak subangular blocky, very compact, decomposing sandstone, heavy $CaCO^3$	
22	0 to 6	10YR 5/3, loose sand with silt, organics, roots, sandstone gravels, light $CaCO^3$	None
	6 to 16	10YR 5/4, silty loam, weak subangular blocky, very compact, decomposing sandstone, heavy $CaCO^3$	
	16 to 40	10YR 6/3, silty loam, loose but compact, decomposing sandstone, heavy $CaCO^3$	

Shovel Test Results, 5PE1813, FCMR.

Shovel Test No.	Depth of Stratum (cm)	General Stratigraphic Description	Materials Recovered
	40	Sandstone bedrock	
23	0 to 6	10YR 5/3, loose sand with silt, organics, roots, sandstone gravels, light $CaCO^3$	None
	6 to 17	10YR 5/4, silty loam, weak subangular blocky, very compact, decomposing sandstone, heavy $CaCO^3$	
	17 to 34	10YR 6/3, silty loam, loose but compact, decomposing sandstone, heavy $CaCO^3$	
24	0 to 8	10YR 5/3, loose sand with silt, organics, roots, sandstone gravels, light $CaCO^3$	None
	8 to 28	10YR 5/4, silty loam, weak subangular blocky, very compact, decomposing sandstone, heavy $CaCO^3$	
	28	Large sandstone gravels	

Average size 33.1 cm x 31.3 cm; Average depth 48.4 cm; Range in depth 5 cm to 72 cm

APPENDIX III

FLAKED-LITHIC TOOL ANALYSIS, FCMR

1999 Projectile Point Table, FCMR

Site Number	Catalog Number	Raw Material Type	Length (mm)	Width (mm)	Thickness (mm)	Blade Length (mm)	Blade Width (mm)	Stem Width (mm)	Stem Length (mm)	Base Width (mm)	Weight (gm)
5EP1080	5EP1080.85b	Silicified wood	22.7*	15.1*	4.2	18.3*	15.1*	6.4*	4.9*	7.1*	1.3*
5EP1345	5EP1345.44f	Chert	28.8*	17.5	4.6	20.8*	17.5	13.4	8.3	12.2*	1.9*
5EP1345	5EP1345.44m	Orthoquartzite	28.9	20.4*	5.1	18.3	20.4*	14.9	10.8	14.8	2.6*
5PE 750	5PE 750.1c	Orthoquartzite	35.2*	18.6	5.7	27.6*	18.6	10.5	8.3	9.9*	3.5*
5PE 750	5PE 750.1d	Chert	24.8*	19.5*	4.4	16.8*	19.5*	13.1	6.1	12.6	2.0*
5PE 750	5PE 750.1h	Orthoquartzite	28.2*	20.6*	6.0	18.2*	20.6*	9.2	7.5	5.3*	2.3*
5PE 750	5PE 750.1l	Orthoquartzite	12.8*	14.4*	2.8	7.8*	11.9	8.7	4.6	14.4*	0.4*
5PE 750	5PE 750.1q	Chert	18.7	14.2	2.9	15.3	14.2	7.5	4.5	9.1	0.6
5PE1800	5PE1800.1a	Chert	26.3*	19.0	3.7	20.8*	19.0	7.3	5.9	7.4	1.4*
5PE1805	5PE1805.1d	Chert	16.7*	21.2*	4.6	12.9*	21.2*	11.1	2.1*	11.1*	1.7*
5PE1809	5PE1809.1a	Chert	23.1	18.2*	3.9	17.4	18.2*	10.5	5.9	13.8	1.5*

* indicates partial measurement

1999 Complete Biface Table, FCMR

Site Number	Catalog Number	Raw Material Type	Weight (gm)	Max Length (mm)	Max Width (mm)	Max Thickness (mm)	Hafted	Size Grade	Shape
5EP1080	5EP1080.85g	Silicified wood	11.4	41.5	28.8	8.8	N	2	Lenticular
5EP1080	5EP1080.113e	Orthoquartzite	57.4	98.3	36.7	19.3	N	3	Knife
5EP1080	5EP1080.118f	Chert	1.1	20.6	14.8	3.6	N	1	Lenticular
5EP1345	5EP1345.47a	Chert	4.3	29.6	21.8	7.5	N	2	Oval
5EP1345	5EP1345.56a	Chert	5.3	33.5	19.7	10.6	N	2	Oval
5EP1345	5EP1345.58m	Chert	2.8	24.1	18.8	5.6	N	2	Oval
5PE1785	5PE1785.1a	Orthoquartzite	22.4	51.3	36.1	13.3	N	3	Oval
5PE1785	5PE1785.1k	Chert	10.4	33.4	28.1	11.3	N	2	Oval
5PE1785	5PE1785.21a	Chert	13.2	36.1	32.7	12.1	N	2	Oval
5PE1803	5PE1803.1a	Orthoquartzite	16.9	48.3	31.2	11.4	N	2	Oval
5PE1803	5PE1803.6a	Chert	1.5	25.6	12.1	4.6	Y	1	Drill
5PE1812	5PE1812.1a	Silicified wood	24.1	45.4	39.2	13.1	N	3	Oval
5PE1813	5PE1813.1d	Orthoquartzite	30.4	52.1	35.1	11.5	N	3	Oval
5PE1813	5PE1813.1g	Orthoquartzite	45.5	47.6	44.1	25.1	N	3	Oval

Key

Size grade 1 = 0 - 1/2"
2 = 1/2 - 1"
3 = 1 - 1 1/2"

1999 Broken Biface Table, FCMR

Site Number	Catalog Number	Raw Material Type	Weight (gm)	Hafted	Size Grade	Portion Remaining
5EP1080	5EP1080.85f	Chert	0.6	N	1	Biface tip
5EP1080	5EP1080.115c	Orthoquartzite	1.4	N	1	Proximal end
5EP1345	5EP1345.44e	Silicified wood	0.9	N	1	Fragment, one edge
5EP1345	5EP1345.44j	Chert	1.3	N	2	Midsection
5EP1345	5EP1345.44k	Chert	1.1	N	1	Fragment, one edge
5EP1345	5EP1345.44l	Chert	1.5	N	2	Rounded edge
5EP1345	5EP1345.44n	Silicified wood	2.8	N	2	Distal end
5EP1345	5EP1345.47b	Chert	0.5	N	1	Tip and portion of blade
5EP1345	5EP1345.49k	Chert	0.4	N	1	Blade fragment
5EP1345	5EP1345.54i	Chert	11.5	N	2	Broken oval
5EP1345	5EP1345.54j	Chert	2.4	N	2	Blade fragment
5EP1345	5EP1345.54k	Chert	0.7	N	1	Proximal end
5EP1345	5EP1345.58d	Silicified wood	2.1	N	2	Proximal end
5EP1345	5EP1345.58n	Chalcedony	1.7	N	2	Distal end
5PE750	5PE750.1e	Chert	2.6	N	1	Base fragment
5PE750	5PE750.1g	Chert	2.7	N	2	Distal end
5PE750	5PE750.1k	Orthoquartzite	17.6	N	2	Distal half
5PE750	5PE750.1p	Chalcedony	1.6	N	1	Distal end
5PE1785	5PE1785.1c	Chert	1.2	N	1	Broken proximal
5PE1785	5PE1785.1g	Orthoquartzite	1.2	N	1	Biface tip
5PE1785	5PE1785.1h	Chert	1.4	N	1	Biface tip
5PE1785	5PE1785.1l	Chalcedony	1.1	N	1	Biface tip
5PE1785	5PE1785.17b	Chert	0.2	N	1	Fragment, one edge
5PE1809	5PE1809.1b	Chert	5.3	N	2	Fragment, two edges
5PE1813	5PE1813.1c	Orthoquartzite	15.2	N	3	Broken oval

Key

Size Grade 1 = 0 - 1/2"
2 = 1/2 - 1"
3 = 1" - 11/2"

1999 Scraper Table, FCMR

Site Number	Catalog Number	Raw Material Type	Weight (gm)	Max Length (mm)	Max Width (mm)	Max Thickness (mm)	Cortex	Angle (degrees)	Size Grade	Wear
5EP1080	5EP1080.85d	Silicified wood	15.8*	40.1	27.4*	10.8	1	110	2	1
5EP1080	5EP1080.85r	Chalcedony	10.5	35.2	31.1	8.7	0	115	2	1
5EP1080	5EP1080.85s	Chert	14.6	41.9	29.4	9.2	0	106	2	1
5EP1080	5EP1080.85u	Chalcedony	3.8*	28.9*	18.1*	4.2	0	114	2	1
5EP1345	5EP1345.44a	Chalcedony	12.4	36.4	29.3	12.5	1	110	2	2
5PE750	5PE750.1b	Chert	6.2*	28.9*	25.7*	9.3	1	119	2	1
5PE750	5PE750.1j	Orthoquartzite	14.9	44.3	30.2	13.8	0	124	2	1
5PE1800	5PE1800.1b	Chert	14.2	40.5	37.1	9.3	0	113	3	1
5PE1804	5PE1804.1a	Chert	8.1	31.9	27.6	9.2	1	115	2	1
5PE1813	5PE1813.1b	Silicified wood	6.9	30.6	24.4	11.1	0	106	2	1

Key

Cortex: 0 = absent; 1 = < 50%

Size Grade: 1 = 0 - 1/2"; 2 = 1/2 - 1"; 3 = 1 - 1 1/2"

Wear: 1 = unimarginal; 2 = bimarginal

* indicates partial measurement

1999 Flaked Tools Table, FCMR

Site Number	Catalog Number	Raw Material Type	Broken	Weight (gm)	Cortex	Wear	Retouch	Size Grade
5EP1080	5EP1080.85e	Silicified wood	N	3.5	1	1	1	1
5EP1080	5EP1080.85h	Chert	N	3.9	1	2	1	2
5EP1080	5EP1080.85q	Chert	N	4.1	0	2	0	2
5EP1080	5EP1080.85t	Chert	N	7.1	0	2	2	2
5EP1080	5EP1080.86a	Silicified wood	Y	1.9	1	0	1	2
5EP1080	5EP1080.90a	Chert	Y	0.3	0	2	0	1
5EP1080	5EP1080.97a	Chert	Y	0.3	1	0	1	1
5EP1080	5EP1080.110b	Chert	Y	0.3	0	1	0	1
5EP1080	5EP1080.110c	Chert	N	10.4	1	2	2	2
5EP1080	5EP1080.110d	Chert	Y	7.6	0	2	2	2
5EP1080	5EP1080.110e	Orthoquartzite	Y	8.1	1	1	1	2
5EP1080	5EP1080.110f	Chert	Y	6.6	1	1	1	2
5EP1080	5EP1080.113d	Chert	N	1.1	1	1	0	1
5EP1080	5EP1080.120a	Chert	Y	2.1	1	1	1	2
5EP1345	5EP1345.44b	Chert	Y	9.2	0	2	0	2
5EP1345	5EP1345.44c	Chert	N	2.0	0	2	0	2
5EP1345	5EP1345.44g	Silicified wood	Y	3.0	1	1	0	2
5EP1345	5EP1345.44i	Orthoquartzite	Y	1.5	0	0	1	2
5EP1345	5EP1345.44o	Chert	Y	8.8	1	2	1	2
5EP1345	5EP1345.44p	Silicified wood	N	22.9	1	1	2	2
5EP1345	5EP1345.44q	Chalcedony	N	5.1	1	1	0	2
5EP1345	5EP1345.47j	Silicified wood	N	1.5	1	1	0	2
5EP1345	5EP1345.47k	Chalcedony	Y	0.5	0	1	0	1
5EP1345	5EP1345.47l	Chert	Y	6.8	1	1	0	2
5EP1345	5EP1345.49g	Silicified wood	Y	0.7	1	1	0	1
5EP1345	5EP1345.49h	Silicified wood	N	14.1	1	2	0	3
5EP1345	5EP1345.49i	Chert	N	2.3	0	2	1	2
5PE750	5PE750.1f	Chert	Y	1.5	1	0	1	1
5PE750	5PE750.1i	Orthoquartzite	Y	9.5	0	0	1	2
5PE750	5PE750.1n	Chert	N	12.6	1	1	2	2
5PE750	5PE750.1o	Chert	Y	3.1	0	1	2	2
5PE1785	5PE1785.1b	Chert	N	67.7	2	2	2	3
5PE1785	5PE1785.1d	Chalcedony	Y	2.1	0	2	0	2
5PE1785	5PE1785.1e	Chert	Y	2.8	1	1	0	2

1999 Flaked Tools Table, FCMR

Site Number	Catalog Number	Raw Material Type	Broken	Weight (gm)	Cortex	Wear	Retouch	Size Grade
5PE1785	5PE1785.1i	Chalcedony	Y	13.0	0	1	2	3
5PE1785	5PE1785.1m	Orthoquartzite	N	86.1	1	1	2	3
5PE1785	5PE1785.2a	Chert	Y	0.2	0	1	1	1
5PE1785	5PE1785.11a	Silicified wood	N	0.2	0	1	0	1
5PE1785	5PE1785.13a	Limestone	Y	70.9	2	2	0	3
5PE1785	5PE1785.16a	Chalcedony	Y	0.8	0	1	0	1
5PE1785	5PE1785.22a	Chalcedony	N	2.4	0	1	0	2
5PE1803	5PE1803.1b	Chalcedony	N	1.5	0	2	0	2
5PE1803	5PE1803.1c	Chalcedony	Y	18.6	1	0	1	3
5PE1803	5PE1803.1e	Chalcedony	Y	1.1	0	2	0	1
5PE1803	5PE1803.1f	Orthoquartzite	N	38.1	2	1	0	4
5PE1803	5PE1803.1g	Chalcedony	Y	1.1	0	1	0	1
5PE1803	5PE1803.1h	Chalcedony	Y	0.7	0	2	0	1
5PE1803	5PE1803.1i	Chalcedony	N	6.5	1	1	1	2
5PE1803	5PE1803.1j	Chert	N	1.4	0	1	1	2
5PE1803	5PE1803.1k	Orthoquartzite	N	32.2	1	2	2	3
5PE1803	5PE1803.1l	Silicified wood	Y	2.9	0	1	1	2
5PE1803	5PE1803.11a	Silicified wood	Y	0.4	0	0	1	1
5PE1803	5PE1803.11c	Chalcedony	Y	2.8	0	1	0	2
5PE1805	5PE1805.1b	Chert	N	9.0	1	1	2	2
5PE1805	5PE1805.1c	Chalcedony	Y	8.4	0	1	0	2
5PE1805	5PE1805.1e	Orthoquartzite	Y	5.8	0	1	0	2
5PE1805	5PE1805.12a	Chert	N	0.3	0	1	0	1
5PE1807	5PE1807.16a	Chalcedony	Y	0.2	1	1	2	1
5PE1813	5PE1813.1a	Chalcedony	Y	3.8	0	1	1	2
5PE1813	5PE1813.1f	Orthoquartzite	Y	220.2	0	0	1	5
5PE1813	5PE1813.3a	Chert	N	11.5	0	2	1	2

Key

Cortex: 0 = Absent; 1 = < 50%

Wear: 0 = Absent; 1 = Unimarginal; 2 = Bimarginal

Retouch: 0 = Absent; 1 = Unimarginal; 2 = Bimarginal

Size: 1 = 0 - 1/2"; 2 = 1/2 - 1"; 3 = 1 - 1 1/2"; 4 = 1 1/2 - 2"; 5 = >2"

1999 Chopper Table, FCMR

Site Number	Catalog Number	Raw Material Type	Weight (gm)	Max Length (mm)	Max Width (mm)	Max Thickness (mm)	Flakes Removed	Use Wear	Comments
5PE750	5PE750.1m	Orthoquartzite	258.7	89.7	75.9	30.7	7	P	Tabular
5PE1610	5PE1610.15a	Orthoquartzite	575.6	119.8	94.6	43.7	2	P	Wedge shape
5PE1785	5PE1785.1j	Quartzite	325.7	95.7	91.9	39.2	3	A	Wedge shape
5PE1800	5PE1800.1c	Orthoquartzite	245.1	93.8	75.2	31.9	4	P	Wedge shape
5PE1807	5PE1807.1a	Orthoquartzite	327.1	91.1	71.5	41.5	2	P	Wedge shape
5PE1807	5PE1807.9b	Orthoquartzite	362.5	105.5	77.1	33.6	5	A	Wedge shape

Key

Use wear P = Present
A = Absent

1999 Cores Table, FCMR

Site Number	Catalog Number	Raw Material Type	Direction	Max Length (mm)	Max Width (mm)	Max Thickness (mm)	Cortex
5EP1345	*	Chert	3	55	40	25	P
5EP1345	*	Orthoquartzite	3	70	45	30	P
5EP1345	*	Chert	3	35	35	20	P
5EP1345	*	Limestone	3	70	40	40	P
5EP1345	5EP1345.45c	Chert	2	32	31	22	P
5EP1345	5EP1345.47d	Chert	2	29	22	17	P
5EP1345	5EP1345.49j	Chalcedony	2	67	56	43	P
5EP1345	5EP1345.50g	Chert	3	33	22	14	A
5PE750	*	Orthoquartzite	2	35	25	15	P
5PE750	*	Orthoquartzite	2	90	60	15	P
5PE750	*	Chert	3	45	40	35	P
5PE750	*	Orthoquartzite	1	130	100	80	P
5PE750	5PE750.3a	Orthoquartzite	2	41	35	15	P
5PE1785	*	Orthoquartzite	1	95	60	35	^
5PE1785	*	Orthoquartzite	3	105	75	15	^
5PE1785	*	Silicified wood	3	35	30	25	^
5PE1800	*	Orthoquartzite	2	160	100	100	P
5PE1803	*	Chalcedony	3	50	40	20	A
5PE1803	*	Chert	3	35	30	10	P
5PE1803	*	Orthoquartzite	1	50	30	30	P
5PE1803	*	Chert	3	40	25	15	P
5PE1803	*	Chalcedony	3	50	40	40	P
5PE1803	*	Chalcedony	1	30	30	30	P
5PE1803	*	Chalcedony	3	40	30	30	P
5PE1803	*	Chert	3	40	30	15	P
5PE1803	*	Chalcedony	3	50	40	30	P
5PE1803	*	Chalcedony	3	25	20	15	A
5PE1803	5PE1803.11b	Orthoquartzite	2	83	59	58	P
5PE1805	*	Chert	^	42	25	24	P
5PE1805	*	Chalcedony	^	25	25	18	P
5PE1805	*	Orthoquartzite	^	60	55	50	P
5PE1805	*	Orthoquartzite	^	60	54	45	P
5PE1805	*	Orthoquartzite	^	80	65	40	P
5PE1805	*	Chert	^	30	25	20	P

1999 Cores Table, FCMR

Site Number	Catalog Number	Raw Material Type	Direction	Max Length (mm)	Max Width (mm)	Max Thickness (mm)	Cortex
5PE1805	*	Chalcedony	^	30	21	15	P
5PE1805	5PE1805.4c	Orthoquartzite	2	55	43	24	A
5PE1805	5PE1805.5c	Orthoquartzite	2	54	52	46	P
5PE1805	5PE1805.5c	Orthoquartzite	2	53	39	22	A
5PE1805	5PE1805.5c	Orthoquartzite	2	43	28	27	A
5PE1807	*	Chalcedony	2	48	22	18	P
5PE1807	*	Chalcedony	2	59	34	21	P
5PE1807	5PE1807.6b	Chert	1	70	52	25	A
5PE1807	5PE1807.18e	Orthoquartzite	1	64	45	26	P
5PE1809	*	Orthoquartzite	3	40	35	20	P
5PE1809	*	Orthoquartzite	1	105	70	60	P
5PE1809	*	Orthoquartzite	3	75	60	35	P
5PE1809	*	Orthoquartzite	3	80	60	50	P
5PE1809	*	Orthoquartzite	2	120	95	45	P
5PE1813	*	Orthoquartzite	2	110	70	65	P
5PE1813	*	Orthoquartzite	3	55	50	45	P
5PE1813	*	Orthoquartzite	3	40	35	20	P
5PE1813	*	Orthoquartzite	1	65	40	25	P
5PE1813	*	Orthoquartzite	3	70	50	30	P
5PE1813	*	Orthoquartzite	3	70	70	50	P
5PE1813	*	Orthoquartzite	1	120	80	40	P
5PE1813	*	Orthoquartzite	3	65	50	45	P
5PE1813	*	Orthoquartzite	2	60	50	15	P
5PE1813	*	Orthoquartzite	3	110	70	55	P
5PE1813	*	Orthoquartzite	3	100	75	40	P
5PE1813	*	Orthoquartzite	2	60	50	30	P
5PE1813	*	Orthoquartzite	2	60	50	45	P
5PE1813	*	Orthoquartzite	1	85	70	65	P
5PE1813	*	Orthoquartzite	2	30	30	20	P
5PE1813	*	Siltstone	3	30	25	15	P
5PE1813	*	Orthoquartzite	3	70	65	50	P

Key

Direction: 1 = Unidirectional; 2 = Bidirectional; 3 = Multidirectional

* = Analyzed in field; ^ = Not recorded

Cortex: P = Present; A = Absent

1999 Miscellaneous Tool Table, FCMR

Site Number	Catalog Number	Type	Raw Material Type	Weight (gm)	Max Length (mm)	Max. Width (mm)	Max Thickness (mm)
5EP1345	5EP1345.44d	Tested cobble	Quartzite	299.4	100.2	61.9	48.8
5EP1345	5EP1345.44r	Manuport	Gneiss	76.3	55.7	48.4	15.8
5PE1785	5PE1785.1f	Hammerstone	Quartzite	62.2	41.2	39.3	23.9
5PE1805	5PE1805.1a	Hammerstone	Orthoquartzite	175.3	61.3	51.9	46.5
5PE1805	5PE1805.1g	Hammerstone	Quartz	139.7	62.8	54.1	31.7

APPENDIX IV

GROUNDSTONE TOOL ANALYSIS, FCMR

1999 Metate Table, FCMR

Site Number	Form	Material Type	Type	Condition	Max. Length (cm)	Max Width (cm)	Max Thickness (cm)	Polish	Shape	Pitting/ Pecking	Smoothing	Striations
5PE750	Flat	Sandstone	Slab	3	24	23	7	P	Other	P	Moderate	NA
5PE1610	Flat	Sandstone	Slab	2	19	10	5	A	Rectangular	P	Moderate	U
5PE1610	Flat	Sandstone	Block	3	32	24	7	A	Rectangular	P	Moderate	U
5PE1610	Flat	Sandstone	Block	2	30	18	9	P	U	P	Moderate	U
5PE1610	Shallow basin	Sandstone	Block	3	26	25	9	A	Oval	A	A	U
5PE1785	Flat	Sandstone	Slab	2	18	12	8	P	U	P	Light	NA
5PE1803	Shallow basin	Sandstone	Slab	1	40	34	7	A	Circular	P	Moderate	U
5PE1803	Flat	Sandstone	Slab	2	27	17	6	A	Circular	A	Light	U
5PE1812	Shallow basin	Sandstone	Bedrock	3	30	21	NA	A	Rectangular	A	Moderate	Multidirectional
5PE1813	Shallow basin	Sandstone	Slab	1	38	32	5	A	Rectangular	P	Light	Longitudinal

Key

NA = Not Applicable　　U = Undetermined

Condition　1 = Complete　　Pecking/Pitting　P = Present

2 = < 50%　　A = Absent

3 = Complete

Metates were analyzed in the field

Ground Stone Analysis For FCMR 1999 Field Season

Artifact Number	Prov.	Length (cm)	Width (cm)	weight (gms)	Thickness (cm)	Material Type	Surface Number	Surface Config.	Surface Wear	Surface Texture	Wear Type	Contact Type	Stroke	Residues
5EP1080.85n	surface	13.9	9	765.42	4.1	SST	1	1	1	2	1	2	1	3
							2		1	3	2	1	2	1 and 2
5EP1080.85o	surface	10.2	8.2	538.64	4.1	SST	1	1	1	2	1	1	1	3
							2		1	3	2	1	1	1 and 2
5EP1080.85p	surface	7.1	5.5	232.8	4.1	SST	1	2	4	3	NA	NA	NA	3
							2		2	1	2	NA	NA	2
5PE750.1a	surface	14.1	8.7	708.73	3.9	SST	1	1	1	2	1	1	2	3
							2		1	3	2	1	3	3
5EP1345.44h	surface	11.4	8.1	1034.752	62.4	QZT	1	NA	2	3	1	1	3	3
							2		3	3	1	1	2	3
5EP1345.44r	surface	5.6	4.8	76.4	1.6	MET	0	NA	NA	NA	NA	NA	NA	NA
5PE1809*	surface	9	4.5	NA	2	sst	1	NA	NA	NA	NA	NA	NA	NA
5PE1813.1h	surface	13.8	9.4	963.879	6.1	SST	1	1	2	1	1	1	1	3
5PE1813.1i	surface	14.7	8.5	907.18	4.6	SST	1	1	1	1	1	1	1	3
5PE1813.1j	surface	14.8	9.3	921.354	4.6	SST	1	1	1	1	1	1	1	3
							2		1	1	1	1	2	2
5PE1813.1k	surface	13.4	8	737.08	4.8	SST	1	1	2	1	1	1	1	3
5PE1813.1l	surface	13.6	9.5	878.83	4.9	SST	1	1	2	3	1	1	1	3
5PE1813.1m	surface	12.7	9.2	609.51	4	SST	1	1	2	1	1	1	2	3
							2		2	3	2	1	1	3

*not collected, shot # 21

NA- information not determinable

1999 Mano Analysis Code sheet, FCMR

Site Number
Artifact Number
Provenience
Length (cm)
Width (cm)
Weight (gm)
Thickness (cm)

Material		
	Sandstone	SST
	Quartzite	QZT
	Gneiss	MET
Condition		
	Well Used	1
	Moderate	2
	Not Used	3
Surface Configuration		
	Convex end Flat Edge	1
	Indeterminate	2
	Irregular	3
Surface Wear		
	Heavy	1
	Moderate	2
	Light	3
	Indeterminate	4
Surface Texture		
	Fine	1
	Smooth	2
	Medium	3
Wear Type		
	Rounding	1
	Rounding and Abrasion	2
Contact Type		
	Stone/Stone	1
	Stone/Pliable	2
Stroke		
	Reciprocal Rocking	1
	Circular Rocking	2
	Reciprocal Flat	3
Residues		
	Charcoal	1
	Caliche	2
	None	3

APPENDIX V

FAUNAL ANALYSIS, FCMR

Faunal remains, 5EP1080, FCMR.

Provenience Horizontal	*Vertical	Feature	Species	Element	Portion	Side	Age	Modification	Lth (mm)	Wth (mm)	Thk (mm)	Wgt (gm)	Quantity
Test Unit 1	Ly 2, Lv 1	NA	Small Mammal	Axial	Unknown	Unknown	Unknown	None	NA	NA	NA	NA	1
Test Unit 1	Ly 2, Lv 1	NA	Small Mammal	Unknown	Unknown	Unknown	Unknown	None	NA	NA	NA	NA	1
Test Unit 1	Ly 3, Lv 1	NA	Small Mammal	Unknown	Unknown	Unknown	Unknown	None	NA	NA	NA	NA	1
Test Unit 1	Ly 4, Lv 1	NA	Small Mammal	Unknown	Unknown	Unknown	Unknown	1 burned	NA	NA	NA	NA	3
Test Unit 1	Ly 4, Lv 2	NA	Rodentia	Vertebrae	Whole	Unknown	Adult	None	NA	NA	NA	NA	1
Test Unit 1	Ly 4, Lv 2	NA	Unknown	Unknown	Unknown	Unknown	Unknown	None	NA	NA	NA	NA	4
Test Unit 2	Ly 1, Lv 1	1	Unknown	Unknown	Unknown	Unknown	Unknown	None	NA	NA	NA	NA	2
Test Unit 2	Ly 1, Lv 1	3	Unknown	Unknown	Unknown	Unknown	Unknown	None	NA	NA	NA	NA	4
Test Unit 3	Ly 2, Lv 1	NA	Medium Mammal	Long Bone	Shaft Fragment	Unknown	Unknown	Burned	NA	NA	NA	NA	1
Test Unit 3	Ly 2, Lv 2	NA	Small Mammal	Long Bone	Shaft Fragment	Unknown	Unknown	1 burned	NA	NA	NA	NA	3
Test Unit 3	Ly 2, Lv 2	NA	Small Mammal	Rib	Shaft Fragment	Unknown	Unknown	None	50	10	2	0.2	1
Test Unit 3	Ly 2, Lv 3	NA	Small Mammal	Long Bone	Shaft Fragment	Unknown	Unknown	None	NA	NA	NA	NA	2
Test Unit 3	Ly 2, Lv 3	NA	Rodentia	Axial	Unknown	Unknown	Unknown	None	NA	NA	NA	NA	1
Test Unit 3	Ly 2, Lv 3	NA	Unknown	Unknown	Unknown	Unknown	Unknown	Burned	NA	NA	NA	NA	1
Test Unit 3	Ly 2, Lv 3	NA	Avis	Sternum	Fragment	Unknown	Unknown	None	NA	NA	NA	NA	1
Test Unit 3	Ly 2, Lv 3	NA	Odocoileus sp.	Calcaneum	Fragment	Unknown	Unknown	Burned	NA	NA	NA	NA	1
Shovel Test 10	0-15 cm	NA	Medium Mammal	Long Bone	Shaft Fragment	Unknown	Unknown	None	NA	NA	NA	NA	1
Shovel Test 11	40-52 cm	NA	Odocoileus sp.	Tibia	Shaft Fragment	Unknown	Unknown	None	43	12	2	0.3	1
Shovel Test 11	40-52 cm	NA	Unknown	Unknown	Unknown	Unknown	Unknown	Burned	NA	NA	NA	NA	1
Shovel Test 13	0-10 cm	NA	Unknown	Unknown	Unknown	Unknown	Unknown	None	NA	NA	NA	NA	1
Shovel Test 28	10-20 cm	NA	Odocoileus sp.	Humerus	Shaft Fragment	Left	Adult	None	38	17	3	1.3	1
Shovel Test 28	10-20 cm	NA	Medium Mammal	Long Bone	Shaft Fragment	Unknown	Unknown	None	NA	NA	NA	0.8	1
Shovel Test 28	10-20 cm	NA	Unknown	Unknown	Unknown	Unknown	Unknown	None	NA	NA	NA	NA	1
Shovel Test 29	10-30 cm	NA	Canis	Metatarsal	Proximal End	Left	Adult	None	31	10	8	0.8	1
Shovel Test 29	0-30 cm	NA	Unknown	Unknown	Unknown	Unknown	Unknown	None	NA	NA	NA	NA	3
Shovel Test 33	15-28 cm	NA	Rodentia	Humerus	Proximal End	Right	Adult	None	NA	NA	NA	NA	1
Shovel Test 33	15-28 cm	NA	Small Mammal	Long Bone	Shaft Fragment	Unknown	Unknown	None	NA	NA	NA	NA	1
Shovel Test 38	NA	NA	Small Mammal	Long Bone	Shaft Fragment	Unknown	Unknown	Burned	NA	NA	NA	NA	1
Total													42

y=Layer, Lv=Level

Faunal Remains, 5EP1345, FCMR.

Provenience Horizontal	*Vertical	Species	Element	Portion	Side	Age	Modification	Lth (mm)	Wth (mm)	Thk (mm)	Wgt (gm)	Quantity
Backdirt	NA	Bison	3rd Phalanx	Whole	Left	Adult	Rodent Gnawing	72	45	28	32	1
Test Unit 1	Ly 1, Lv 1	Odocoileus	Rib	Shaft	Unknown	Adult	None	54	14	10	6	1
Test Unit 1	Ly 1, Lv 1	Small Mammal	Long Bone	Shaft Fragment	Unknown	Unknown	1 Burned	NA	NA	NA	NA	10
Test Unit 1	Ly 1, Lv 1	Small Mammal	cranium	Fragment	NA	Unknown	None	29	17	2	0.3	1
Test Unit 1	Ly 1, Lv 1	Rodentia	Rib	Proximal End	Left	Unknown	None	17	3	2	0.1	1
Test Unit 1	Ly 1, Lv 1	Rodentia	Radius	Whole	Right	Adult	None	33	5	4	0.1	1
Test Unit 1	Ly 1, Lv 1	Rodentia	Maxilla	Fragment	Unknown	Adult	None	NA	NA	NA	NA	1
Test Unit 1	Ly 1, Lv 1	Rodentia	Ulna	Distal End	Left	Adult	Burned	5	4	2	0.1	1
Test Unit 1	Ly 1, Lv 1	Rodentia	Phalanx	Whole	Unknown	Adult	None	NA	NA	NA	NA	1
Test Unit 1	Ly 1, Lv 1	Rodentia	Phalanx	Fragment	Unknown	Adult	None	NA	NA	NA	NA	1
Test Unit 1	Ly 1, Lv 1	Rodentia	Skull	Zygoma	NA	Adult	None	NA	NA	NA	0.1	1
Test Unit 1	Ly 1, Lv 1	Rodentia	Tarsal	Whole	Left	Adult	None	NA	NA	NA	0.1	1
Test Unit 1	Ly 1, Lv 1	Rodentia	Vertebra	Dorsal	NA	Adult	None	NA	NA	NA	0.1	1
Test Unit 1	Ly 1, Lv 1	Rodentia	Long Bone	Unknown	Unknown	Unknown	None	NA	NA	NA	0.5	14
Test Unit 1	Ly 1, Lv 1	Rodentia	Long Bone	Unknown	Unknown	Unknown	Burned	NA	NA	NA	0.5	9
Test Unit 1	Ly 1, Lv 2	Medium Mammal	Long Bone	Shaft Fragment	Unknown	Unknown	Shaped into Awl	42	12	3	1.6	1
Test Unit 1	Ly 1, Lv 2	Medium Mammal	Long Bone	Interior	Unknown	Unknown	Burned	20	11	7	0.5	1
Test Unit 1	Ly 1, Lv 2	Small Mammal	Rib	Proximal End	Left	Adult	None	27	8	3	0.4	1
Test Unit 1	Ly 1, Lv 2	Rodentia	Vertebra	Whole	NA	Adult	None	NA	NA	NA	NA	1
Test Unit 1	Ly 1, Lv 2	Rodentia	Vertebra	Whole	NA	Adult	None	NA	NA	NA	NA	1
Test Unit 1	Ly 1, Lv 2	Rodentia	Vertebra	Whole	NA	Adult	None	NA	NA	NA	NA	1
Test Unit 1	Ly 1, Lv 2	Rodentia	Phalanx	Whole	Unknown	Adult	None	NA	NA	NA	NA	1
Test Unit 1	Ly 1, Lv 2	Unknown	Unknown	Unknown	Unknown	Unknown	None	NA	NA	NA	8.1	72
Test Unit 1	Ly 1, Lv 3	Odocoileus	Upper PM	Fragment	Unknown	Fragment	None	24	9	6	0.1	1
Test Unit 1	Ly 1, Lv 3	Sciurdae	Humerus	Proximal End	Right	Adult	None	36	7	4	0.1	1
Test Unit 1	Ly 1, Lv 3	Rodentia	Lower PM	Whole	Unknown	Adult	None	NA	NA	NA	0.1	1
Test Unit 1	Ly 1, Lv 3	Rodentia	Vertebra	Whole	NA	Adult	None	NA	NA	NA	0.1	1
Test Unit 1	Ly 1, Lv 3	Rodentia	Phalanx	Fragment	Unknown	Adult	None	NA	NA	NA	0.2	2
Test Unit 1	Ly 1, Lv 3	Rodentia	Metatarsal	Distal End	Left	Adult	None	NA	NA	NA	0.1	1
Test Unit 1	Ly 1, Lv 3	Rodentia	Unknown	Unknown	Unknown	Unknown	None	NA	NA	NA	7.9	90
Test Unit 1	Ly 1, Lv 3	Unknown	Humerus	Distal End	Left	Adult	Very Weathered	11	11	5	0.1	1
Test Unit 1	Ly 2, Lv 1	Odocoileus	Zygoma	Fragment	NA	Adult	None	32	13	4	0.2	1
Test Unit 1	Ly 2, Lv 1	Medium Mammal	Long Bone	Shaft Fragment	Unknown	Adult	Polishing Tool	48	9	3	1.7	1

Faunal Remains, 5EP1345, FCMR.

Test Unit 1	Ly 2, Lv 1	Medium Mammal	Long Bone	Shaft Fragment	Unknown	Adult	None	NA	NA	NA	1.9	1
Provenience		Species	Element	Portion	Side	Age	Modification	Lth	Wth	Thk	Wgt	Quantity
Horizontal	*Vertical							(mm)	(mm)	(mm)	(gm)	
Test Unit 1	Ly 2, Lv 1	Avis	Tibio-Tarsus	Shaft Fragment	Unknown	Adult	Burned	23	9	7	0.4	1
Test Unit 1	Ly 2, Lv 1	Avis	Radius	Shaft Fragment	Unknown	Adult	None	NA	NA	NA	0.1	1
Test Unit 1	Ly 2, Lv 1	Rodentia	Humerus	Proximal End	Left	Adult	None	NA	NA	NA	0.1	1
Test Unit 1	Ly 2, Lv 1	Rodentia	Humerus	Proximal End	Left	Adult	Burned	NA	NA	NA	0.1	1
Test Unit 1	Ly 2, Lv 1	Rodentia	Unknown	Unknown	Unknown	Unknown	16 Burned	NA	NA	NA	4.6	21
Test Unit 1	Ly 2, Lv 1	Rodentia	Maxilla	Fragment	Unknown	Adult	None	NA	NA	NA	0.1	1
Test Unit 1	Ly 2, Lv 1	Rodentia	Rib	Fragment	Unknown	Adult	None	NA	NA	NA	0.1	1
Test Unit 1	Ly 2, Lv 2	Rodentia	Unknown	Unknown	Unknown	Unknown	None	NA	NA	NA	1.7	26
Test Unit 1	Ly 2, Lv 2	Small Mammal	Unknown	Shaft Fragment	Unknown	Unknown	None	NA	NA	NA	3.6	22
Test Unit 1	Ly 3, Lv 1	Medium Mammal	Long Bone	Shaft Fragment	Unknown	Adult	Small Awl	30	8	3	0.6	1
Test Unit 1	Ly 3, Lv 1	Medium Mammal	Tooth	Buccal Fragment	Unknown	Adult	None	15	6	4	0.3	1
Test Unit 1	Ly 3, Lv 1	Medium Mammal	Long Bone	Shaft Fragment	Unknown	Adult	Polishing	23	9	5	1.1	1
Test Unit 1	Ly 3, Lv 1	Medium Mammal	Long Bone	Shaft Fragment	Unknown	Adult	Burning and Polishing	28	10	3	0.6	1
Test Unit 1	Ly 3, Lv 1	Medium Mammal	Rib	Articular End	Unknown	Adult	Very Weathered	23	8.5	5	0.8	1
Test Unit 1	Ly 3, Lv 1	Small Mammal	Long Bone	Shaft Fragment	Unknown	Adult	None	24	5	4	NA	1
Test Unit 1	Ly 3, Lv 1	Small Mammal	Long Bone	Shaft Fragment	Unknown	Adult	None	35	6	2.5	NA	1
Test Unit 1	Ly 3, Lv 1	Small Mammal	Long Bone	Shaft Fragment	Unknown	Adult	None	23	7	5.5	NA	1
Test Unit 1	Ly 3, Lv 1	Small Mammal	Long Bone	Shaft Fragment	Unknown	Adult	None	26	5	3		1
Test Unit 1	Ly 3, Lv 1	Small Mammal	Long Bone	Shaft Fragment	Unknown	Adult	None	22	9	2.5		1
Test Unit 1	Ly 3, Lv 1	Small Mammal	Long Bone	Shaft Fragment	Unknown	Adult	None	16	10	4.5		1
Test Unit 1	Ly 3, Lv 1	Small Mammal	Long Bone	Shaft Fragment	Unknown	Adult	None	19	7	5		1
Test Unit 1	Ly 3, Lv 1	Small Mammal	Long Bone	Shaft Fragment	Unknown	Adult	None	20	5	1.5		1
Test Unit 1	Ly 3, Lv 1	Small Mammal	Long Bone	Shaft Fragment	Unknown	Adult	None	12	7	2		1
Test Unit 1	Ly 3, Lv 1	Small Mammal	Long Bone	Shaft Fragment	Unknown	Adult	None	18	7	1		1
Test Unit 1	Ly 3, Lv 1	Small Mammal	Long Bone	Shaft Fragment	Unknown	Adult	None	17	5	1		1
Test Unit 1	Ly 3, Lv 1	Small Mammal	Long Bone	Shaft Fragment	Unknown	Adult	None	16	3	1		1
Test Unit 1	Ly 3, Lv 1	Small Mammal	Long Bone	Shaft Fragment	Unknown	Adult	None	16	5	2		1
Test Unit 1	Ly 3, Lv 1	Small Mammal	Long Bone	Shaft Fragment	Unknown	Adult	None	13	5	1		1
Test Unit 1	Ly 3, Lv 1	Small Mammal	Long Bone	Shaft Fragment	Unknown	Adult	None	11	5	2.5		1
Test Unit 1	Ly 3, Lv 1	Small Mammal	Long Bone	Shaft Fragment	Unknown	Adult	None	37	6	1		1
Test Unit 1	Ly 3, Lv 1	Small Mammal	Long Bone	Shaft Fragment	Unknown	Adult	Polishing	28	8	2		1
Test Unit 1	Ly 3, Lv 1	Small Mammal	Illium	Fragment	Unknown	Adult	None	17	9	4	0.5	1
Test Unit 1	Ly 3, Lv 1	Avis	Skull	Fragment	NA	Unknown	None	14	12	0.5		1

Faunal Remains, 5EP1345, FCMR.

Provenience Horizontal	*Vertical	Species	Element	Portion	Side	Age	Modification	Lth (mm)	Wth (mm)	Thk (mm)	Wgt (gm)	Quantity
Test Unit 1	Ly 3, Lv 1	Avis	Long Bone	Shaft Fragment	Unknown	Adult	None	30	3	1	0.1	1
Test Unit 1	Ly 3, Lv 1	Avis	Radius	Shaft	Left	Adult	None	30	3	1	0.1	1
Test Unit 1	Ly 3, Lv 1	Avis	Coracoid	Shaft	Right	Adult	None	24	9	4	0.1	1
Test Unit 1	Ly 3, Lv 1	Avis	Long Bone	Shaft Fragment	Unknown	Adult	None	15	6	1	0.1	1
Test Unit 1	Ly 3, Lv 1	Sciuridae	Mandible	Premolar	Left	Adult	None	13	12	5.5	0.5	1
Test Unit 1	Ly 3, Lv 1	Sciurdae	Femur	Proximal End	Left	Adult	None	15	7.5	3	0.2	1
Test Unit 1	Ly 3, Lv 1	Sciurdae	Rib	Shaft Fragment	Unknown	Adult	None	24	7	1	0.1	1
Test Unit 1	Ly 3, Lv 1	Sciuridae	Long Bone	Shaft Fragment	Unknown	Adult	None	19	8	3	0.1	1
Test Unit 1	Ly 3, Lv 1	Sciuridae	Tibia	Distal End	Left	Adult	None	22	8	5	0.1	1
Test Unit 1	Ly 3, Lv 1	Sciuridae	Tibia	Distal End	Left	Adult	None	10	8	5	0.1	1
Test Unit 1	Ly 3, Lv 1	Sciuridae	Tibia	Shaft	Left	Adult	None	25	6	4	0.3	1
Test Unit 1	Ly 3, Lv 1	Rodentia	Unknown	Unknown	Unknown	Unknown	None	NA	NA	NA	6.1	145
Total												480

*Ly = Layer, Lv = Level

Faunal remains, 5PE1610, FCMR.

Provenience		Species	Element	Portion	Side	Age	Modification	Lth	Wth	Thk	Wgt	Quantity
Horizontal	*Vertical							(mm)	(mm)	(mm)	(gm)	
Test Unit 1	Ly 1, Lv 1	Rodentia	Metatarsal	Whole	Left	Adult	None	31	3	2	0.2	1
Test Unit 1	Ly 1, Lv 1	Rodentia	Metatarsal	Whole	Left	Adult	None	34	3	2	0.2	1
Test Unit 1	Ly 1, Lv 1	Rodentia	Mandible	Whole	Right	Adult	None	23	10	4	0.4	1
Test Unit 1	Ly 1, Lv 1	Rodentia	Femur	Distal End	Right	Adult	None	12	6	5	0.2	1
Test Unit 1	Ly 1, Lv 1	Rodentia	Ischium	Whole	Unknown	Adult	None	15	8	3	0.2	1
Test Unit 1	Ly 1, Lv 1	Rodentia	Axis	Whole	Unknown	Adult	None	NA	NA	NA	7.9	56
Test Unit 1	Ly 1, Lv 1	Rodentia	Vertebra	Whole	NA	Adult	None	NA	NA	NA	NA	1
Test Unit 1	Ly 1, Lv 1	Rodentia	Mandible	Front	Left	Adult	None	NA	NA	NA	NA	1
Test Unit 1	Ly 1, Lv 1	Rodentia	Mandible	Front	Right	Unknown	None	NA	NA	NA	NA	1
Test Unit 1	Ly 1, Lv 1	Rodentia	Molar	Whole	Unknown	Unknown	None	NA	NA	NA	NA	1
Test Unit 1	Ly 1, Lv 1	Rodentia	Incisors	Whole	Unknown	Unknown	None	NA	NA	NA	NA	1
Test Unit 1	Ly 1, Lv 1	Rodentia	Tibia	Whole	Right	Adult	None	NA	NA	NA	NA	1
Test Unit 1	Ly 1, Lv 1	Rodentia	Tibia	Whole	Left	Adult	None	NA	NA	NA	NA	1
Test Unit 1	Ly 1, Lv 1	Rodentia	Metapodial	Whole	Unknown	Adult	None	NA	NA	NA	NA	1
Test Unit 1	Ly 1, Lv 1	Rodentia	Femur	Proximal End	Unknown	Adult	None	NA	NA	NA	NA	1
Test Unit 1	Ly 1, Lv 1	Rodentia	Axial	Fragment	Unknown	Unknown	None	NA	NA	NA	NA	1
Test Unit 1	Ly 1, Lv 2	Rodentia	Incisors	Whole	Unknown	Adult	None	NA	NA	NA	0.5	2
Test Unit 1	Ly 1, Lv 2	Rodentia	Molar	Whole	Unknown	Adult	None	NA	NA	NA	NA	1
Test Unit 1	Ly 1, Lv 2	Rodentia	1st Phalanx	Whole	Unknown	Adult	None	NA	NA	NA	NA	1
Test Unit 1	Ly 1, Lv 2	Rodentia	Atlas	Whole	Unknown	Adult	None	NA	NA	NA	NA	1
Test Unit 1	Ly 1, Lv 2	Rodentia	Unknown	Unknown	Unknown	Unknown	None	NA	NA	NA	NA	20
Test Unit 1	Ly 2, Lv 1	Rodentia	Mandible	Whole	Unknown	Adult	None	NA	NA	NA	0.8	2
Test Unit 1	Ly 2, Lv 1	Rodentia	Tibia	Whole	Left	Adult	None	NA	NA	NA	NA	1
Test Unit 1	Ly 2, Lv 1	Rodentia	Femur	Whole	Left	Adult	None	NA	NA	NA	NA	1
Test Unit 1	Ly 2, Lv 1	Rodentia	Long Bone	Shaft	Unknown	Unknown	Needle	24	3	2	0.2	1
Test Unit 1	Ly 2, Lv 1	Rodentia	Unknown	Unknown	Unknown	Unknown	9 Burned	NA	NA	NA	NA	21
Test Unit 1	Ly 3, Lv 1	Small Mammal	Tibia	Fragment	Left	Adult	Burned	11	3	2	0.1	1
Shovel Test 2	40-60 cm	Small Mammal	Long Bone	Fragment	Unknown	Unknown	None	NA	NA	NA	NA	10
Shovel Test 3	0-20 cm	Sciuridae	Mandible	Fragment	Right	Unknown	None	NA	NA	NA	NA	1
Shovel Test 3	0-20 cm	Sciuridae	Sacrum	Proximal End	Unknown	Unknown	None	NA	NA	NA	NA	1
Shovel Test 3	0-20 cm	Sciuridae	Vertebra	Fragment	NA	Unknown	None	NA	NA	NA	NA	1
Total												136

* Ly = Layer, Lv = Level

Faunal Remains, 5PE1807, FCMR.

Provenience		Species	Element	Portion	Side	Age	Modification	Lth	Wth	Thk	Wgt	Quantity
Horizontal	*Vertical							(mm)	(mm)	(mm)	(gm)	
Test Unit 1	Ly 2, Lv 1	Unknown	Unknown	Unknown	Unknown	Unknown	None	NA	NA	NA	0.1	1
Test Unit 1	Ly 2, Lv 2	Odocoileus	1st Phalanx	Whole	Unknown	Adult	None	26	11	7	2.1	1
Test Unit 1	Ly 2, Lv 1	Rodentia	Ulna	Distal End	Right	Adult	None	NA	NA	NA	NA	1
Test Unit 1	Ly 2, Lv 1	Unknown	Unknown	Unknown	Unknown	Unknown	None	NA	NA	NA	0.9	35
Test Unit 1	Ly 2, Lv 3	Rodentia	Maxilla	Fragment	Unknown	Adult	None	NA	NA	NA	NA	2
Test Unit 1	Ly 2, Lv 3	Rodentia	Molar	Fragment	Unknown	Unknown	None	NA	NA	NA	NA	2
Test Unit 1	Ly 2, Lv 3	Rodentia	Incisor	Fragment	Unknown	Unknown	None	NA	NA	NA	NA	2
Test Unit 1	Ly 2, Lv 3	Rodentia	Metapodial	Proximal End	Unknown	Adult	None	NA	NA	NA	NA	1
Test Unit 1	Ly 2, Lv 3	Rodentia	Unknown	Shaft	Unknown	Unknown	None	NA	NA	NA	29	77
Test Unit 1	Ly 2, Lv 4	Rodentia	Metatarsal	Whole	Unknown	Adult	None	NA	NA	NA	5.5	1
Test Unit 1	Ly 2, Lv 4	Rodentia	Calcanus	Whole	Right	Adult	None	NA	NA	NA	NA	1
Test Unit 1	Ly 2, Lv 4	Rodentia	Scapula	Proximal End	Unknown	Adult	None	NA	NA	NA	NA	1
Test Unit 1	Ly 2, Lv 4	Rodentia	Vertebra	Fragment	NA	Immature	None	NA	NA	NA	NA	1
Test Unit 1	Ly 2, Lv 4	Rodentia	Unknown	Unknown	Unknown	Unknown	None	NA	NA	NA	NA	36
Test Unit 1	Ly 3, Lv 1	Large Mammal	1st Phalanx	Proximal End	Unknown	Adult	None	34	19	12	2.5	1
Test Unit 1	Ly3, Lv 1	Medium Mammal	Long Bone	Shaft	Unknown	Unknown	None	NA	NA	NA	NA	3
Test Unit 1	Ly 3, Lv 1	Small Mammal	Rib	Proximal End	Left	Adult	None	NA	NA	NA	NA	2
Test Unit 1	Ly 3, Lv 1	Rodentia	Metapodial	Proximal End	Unknown	Adult	None	NA	NA	NA	NA	1
Test Unit 1	Ly 3, Lv 1	Rodentia	Unknown	Unknown	Unknown	Unknown	None	NA	NA	NA	10	200
Test Unit 1	Ly 3, Lv 2	Sciuridae	Metapodial	Proximal End	Unknown	Adult	None	NA	NA	NA	NA	1
Test Unit 1	Ly 3, Lv 2	Sciuridae	Maxilla	Fragment	Unknown	Adult	None	NA	NA	NA	9	90
Shovel Test 6	0-10 cm	Sciuridae	Mandible	Fragment	Right	Adult	None	NA	NA	NA	NA	1
Total												461

Faunal Remains, 5PE1805, FCMR.

Provenience		Species	Element	Portion	Side	Age	Modification	Lth	Wth	Thk	Wgt	Quantity
Horizontal	*Vertical							(mm)	(mm)	(mm)	(gm)	
Test Unit 2	Ly 2, Lv 2	Rodentia	Rib	Shaft	Unknown	Unknown	None	18	2	2	0.1	1
Test Unit 2	Ly 2, Lv 2	Rodentia	Rib	Shaft	Unknown	Unknown	None	15	2	2	0.1	1
Total												2

*Ly = Layer, Lv = level

APPENDIX VI

MACROBOTANICAL ANALYSIS, FCMR

RESULTS OF ANALYSIS OF MACROBOTANICAL REMAINS FROM FOUR SITES IN THE FORT CARSON MILITARY RESERVATION, COLORADO

By

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INTRODUCTION

The following report provides the results of macrobotanical analysis of flotation samples retrieved at four sites, 5PE1610, 5PE1807, 5EP1080, and 5EP1345, located within the Ft. Carson Military Reservation south of Colorado Springs, Colorado. A total of 16 flotation samples were analyzed from the four sites. Also analyzed were vegetal remains collected from two water screen samples from 5PE1807. Sites 5PE1610, 5PE1807, and 5EP1345 are rock shelters and 5EP1080 is an open site. The samples were retrieved during limited testing at the fours sites, conducted to assess the data potential of the sites and assist in determining the eligibility status of the sites for nomination to the National Register of Historic Places. Description of the sites and sample contexts are provided below. The main purpose for conducting the macrobotanical analysis was to ascertain the potential for retrieving archaeobotanical data that could provide data relevant to research themes and possibly define some of the botanical resources exploited by the occupants of the various sites. A secondary purpose of the analysis was to provide ancillary data that would assist in descriptive interpretation of the individual contexts/features sampled.

PROCESSING AND ANALYTICAL METHODS

The flotations samples were processed by Ft. Lewis College students using a simple water decant system that allows for the separation of the samples into light and heavy fractions. The principle behind a water flotation system is that material with a specific density less than water, such as botanical remains, will float and can be separated from a soil matrix. The resultant light fraction should contain this floated material. The heavy fraction will contain cultural and noncultural materials that did not float but will be separated from the soil matrix, which is rinsed away. Only the light fraction residues from the samples were submitted to the analyst.

There are two levels of analysis that can be conducted on a flotation sample: scan analysis or full sort analysis. It is standard procedure to initially scan the light fraction residue of each flotation sample. Scanning is a cursory inspection of the light fraction, used as a means to expediently examine the botanical content of a sample and to assess the diversity and cultural integrity of botanical remains. Based on the contents of a sample, it either remains as a scan sample or it is subjected to full sort analysis. Selection of samples for complete analysis is subjectively based on diversity of taxa, type of remains recovered, and/or quantity of remains of individual taxon. Only scan analysis was conducted on the samples from site 5PE1610 because none of the samples qualified for full sort analysis. Full sort analysis was completed on one or more samples from each of the other three sites.

To facilitate analysis of the floated residue, it is first poured through graduated screens (5.6 mm, 2.0 mm, 1.0 mm, 0.5 mm, catch pan) and analyzed/scanned by size grades. During a full sort, 20 pieces of wood from the two largest screens are selected for identification and wood within each taxon is quantified by weight. During the scan process, only a few pieces of charcoal from these screens are selected for taxa identification and the charred wood is not quantified in any way. Consequently, wood identified during a scan analysis is not necessarily representative of the full range of woody taxa that may be in the sample. For full sort analysis, the contents of the 1.0 and 0.5 mm screens are thoroughly analyzed and remains in the catch pan are scanned or intensively inspected, depending on the contents of the residue. Botanical remains are identified and separated to the finest taxonomic level possible and information such as quantity, plant part, and condition (e.g., charred, fragmented) is recorded for each taxon. If a large number of seeds is found during a full sort, only a subsample is collected from the light fraction residue. During scan analysis, the separated residue from all screens is rapidly checked for botanical remains, but residue in the catch pan is usually not inspected. Identification of taxon, plant part, and condition of the remains are documented, with seeds and other reproductive parts quantified in multiples of ten. Various parts of corn plants recovered, such as cupules or kernels, are counted. All other plant parts are just noted as present. Analysis of flotation samples is conducted with a binocular microscope with a magnification range of 10X-70X.

Vegetal remains usually do not require any processing. The vegetal materials are analyzed in their entirety, separated by taxon and part, and documented/quantified the same as botanical remains in full sorted flotation samples.

RESULTS

The productivity of the light fraction residues varied by site, with the greatest return of remains from samples collected at site 5EP1345. Plant remains represented include fragments of wood, various seeds, nut/acorn shells, coniferous needles, and a limited number of corn cupules and a glume. Twenty-eight taxa of plants were identified in total from the four sites: seven types of wood, seven taxa of weedy annuals, thirteen kinds of wild plants, and one cultigen (Table 1). Most of the wood fragments were charred, as were some of the seeds and all of the corn. However, a lot of the seeds were uncharred and some of the uncharred seeds were obviously recent in origin. Usually the charred condition of plant remains from open-air sites, especially seeds, is considered to indicate association with the occupation of the site. Uncharred remains are believed to be postoccupation contaminates (Gasser 1982; Keepax 1977; Lopinot and Brussell 1982; Minnis 1981; Pearsall 1989). But three of the sites are rock shelters, which provide a more protected environment and greater preservation potential for uncharred botanical remains. All of the rock shelters exhibited packrat disturbance and most of the samples had moderate to high presence of rodent fecal pellets, insect parts, and insect

cocoons in them, indicating some level of disturbance/contamination. Also, a lot of the uncharred seeds, especially juniper (*Juniperus*) and goosefoot (*Chenopodium*) seeds, showed evidence of insect/rodent predation. Given the high levels of disturbance in the sites, it is difficult to say with certainty that the uncharred botanical remains are associated with the prehistoric use of the rock shelters and, based on the above indicators, it is believed that a high proportion of the uncharred remains are not. Consequently, while it is acknowledged that the some of the uncharred seeds found in the samples from the rock shelters may be associated with the prehistoric use of the sites, for the purposes of this report only the charred remains will be considered as unquestionably associated with the use of the rock shelters. Furthermore, the uncharred remains from 5EP1080, the open air site, are considered to be contaminants, unrelated to the prehistoric occupation of the site.

5PE1610

Site 5PE1610 is a rock shelter that had a small number of artifacts on the shelter floor and few artifacts retrieved during subsurface testing. One test unit was excavated and three flotation samples from three layers within the unit were analyzed. A radiocarbon sample from Layer 2 of the unit provided a calibrated date of A.D. 1005-1220. Samples were collected from Layers 2, 3, and 4, all of which had charcoal flecked or enriched soil and believed to be ethnostratigraphic units. The results of analysis are presented in Table 2.

As can be seen in Table 2, nine taxa of plants are represented in the archaeobotanical assemblage from the site. Layer 2 contained the highest number of plant taxa and plant parts, Layer 3 was almost devoid of remains, and Layer 4 had a moderate botanical content. All three layers had 1 or more charred goosefoot seeds and Layer 2 also contained a charred serviceberry (*Amelanchier*) seed and unidentified composite (Compositae) seed. In addition, a small quantity of charred juniper and pinyon (*Pinus edulis*) wood was noted. Uncharred remains consisted of seeds of serviceberry, goosefoot, juniper, prickly pear cactus (*Opuntia*), ground cherry (*Physalis*), purslane (*Portulaca*), an unidentified legume (Leguminosae), and pinyon nuts and a pinyon umbo, which is the tip portion of the cone scale.

Table 1. Taxa Identified

Taxon	Common Name	5PE1610	5PE1807	5EP1080	5EP1345
Amaranthus sp.	pigweed				X
Amelanchier sp.	serviceberry	X			X
Cercocarpus sp.	mountain mahogany				X
Chenopodium sp.	goosefoot	X	X	X	X
Compositae	Sunflower family	X			X
Corispermum sp.	winged pigweed			X	
Dicotyledoneae	Dicot class				X
*Echinocereus sp.**	hedgehog cactus		X	X	X
*Euphorbia sp.**	spurge				X
Gramineae	Grass family		X	X	X
*Helianthus sp.**	sunflower				X
Iva sp.	sumpweed				X
Juniperus sp.	juniper	X	X		X
Leguminosae	Pea family	X	X		X
*Lithospermum sp.**	gromwell				X
Malvaceae	Mallow family				X
Opuntia sp.	prickly pear cactus	X	X		X
Physalis sp.	ground cherry	X	X	X	X
Pinus edulis	pinyon	X	X		X
Pinus ponderosa	ponderosa pine				X
Polygonum sp.	knotweed			X	X
Populus sp.	cottonwood				X
*Portulaca sp.**	purslane	X	X	X	X
Prunus sp.	chokecherry				X
Quercus sp.	oak				X
Rosaceae	Rose family		X		
*Scrophulariaceae**	Figwort family				X
Zea mays	maize				X

* - only uncharred remains recovered

Table 2. Results of Macrobotanical Analysis: 5PE1610

Taxon	Part	Provenience		
		Test Unit 1		
		Layer 2, Lev.1 FS 4	Layer 3 FS 5	Layer 4, Lev.1 FS 9
Amelanchier sp.	seed	1/a*		
Chenopodium sp.	seed	a/g*	a	1/a*
Compositae	seed	1		
Juniperus sp.	seed wood	a* X	 X	c*
Leguminosae	seed	1*		a*
Opuntia sp.	seed	a*		a*
Physalis sp.	seed	a*		a*
Pinus edulis	nut wood umbo	a* X 1*		a*
Portulaca sp.	seed	1*		

Note: Remains are charred unless otherwise noted.
* - uncharred
a - between 2 and 10 items
c - between 21-30 items
g - between 60 and 100 items
#/#* - both charred and uncharred remains recovered

5PE1807

Site 5PE1807 is a small, shallow rock shelter and associated scatter of artifacts dispersed across a bench outside the shelter. The site was originally believed to have been occupied during the protohistoric or early historic period, but two radiocarbon samples provided calibrated dates of A.D. 385-625 and A.D. 410-675. Two test units were excavated at the site, one within the alcove (Test Unit 1) and one outside on the bench (Test Unit 2). Six flotation samples from two layers defined in Test Unit 1 and two vegetal samples from Test Unit 2, Layer 2 were analyzed. One of the flotation samples merited full sort analysis and the remaining five samples were scanned. The results of analysis are presented in Table 3.

From Test Unit 1 within the alcove, most of the botanical remains from Layer 2 were uncharred, with the exception of one goosefoot seed and a juniper seed from Level 3 of Layer 2. Charred botanical remains increased slightly in Level 1 of Layer 3, although occurrence of charred remains were sparse in general and dropped off below Level 1 in Layer 3. Charred remains from Layer 3 included some goosefoot seeds, an unidentified grass seed, and a small amount of juniper wood. Uncharred remains from Test Unit 1 consisted of seeds of goosefoot, hedgehog cactus (*Echinocereus*), juniper, prickly pear cactus, ground cherry, puslane, and an unidentified grass, legume, and rosaceous plant (Rosaceae). Also, pinyon nut shell fragments and an umbo were noted.

The vegetal remains from two water screened samples processed from Test Unit 2 included uncharred juniper berries and a juniper seed, as well as an uncharred prickly pear cactus seed. It is highly likely that these uncharred remains are not associated with the occupation of the site given they are from an exposed, open area of the site.

5EP1080

Site 5EP1080 is an open air site believed to be a campsite. The artifact assemblage included cord-marked and plain pottery, indicating the occupation to date to the Early-Middle Ceramic periods. Radiocarbon samples provided dates of A.D. 870-1255 and A.D. 1185-1285. Three flotation samples, collected from three features, were analyzed from this site. The three features, Features 1, 2, and 3, are stains of undetermined function that were found in a 1 x 1 m test unit. The sample from Feature 1 was fully sorted but the other two were only scanned. All three features were shallow, 5-7 cm deep, and showed heavy bioturbation. Table 4 provides the results of analysis. As previously mentioned, the uncharred remains from this site are considered to be contaminants, unrelated to the prehistoric use of the site.

Table 3. Results of Macrobotanical Analysis: 5PE 1807

Taxon	Part	Provenience							
		Test Unit 1						Test Unit 2	
		Layer 2 Level 1 FS 2	Layer 2 Level 2 FS 3	Layer 2 Level 3 FS 5	Layer 2 Level 4 FS 6	Layer 3 Level 1 FS 12❖	Layer 3 Level 2 FS 21	Layer 2 Level 1 FS 4, veg	Layer 2 Level 2 FS 7, veg
Chenopodium sp.	seed	h*	a*	1	a*	4/10*	a*		
Echinocereus sp.	seed			1*					
Gramineae	seed	a*				1			
Juniperus sp.	seed berry wood	b*	1*	1		4* 1* 0.1g	1*	1* 2*	
Leguminosae	seed	a*	a*						
Opuntia sp.	seed	a*				2*			1*
Physalis sp.	seed	a*							
Pinus edulis	nut/shell	1	1*			6fg* 1*	a*		
Portulaca sp.	seed		a*						
Rosaceae	seed					4*			

Note: All remains are charred and all samples scanned unless otherwise noted.
❖ - full sort sample
veg - water screened material
* - uncharred

a - between 2-10 items
b - between 11-20 items
h - more than 101 items
#/#* - both charred and uncharred remains represented

Table 4. Results of Macrobotanical Analysis: 5EP1080

Taxon	Part	Provenience		
		Feat. 1 Stain FS 18❖	Feat. 2 Stain FS 21	Feat. 3 Stain FS 22
Chenopodium sp.	seed	41/8*	1/a*	a/1*
Corispermum sp.	seed	1		
Echinocereus sp.	seed	1*		
Gramineae	seed	1/3*		a
Physalis sp.	seed	1*		
Polygonum sp.	seed	1*		
Portulaca sp.	seed	4*	1*	

Note: All remains are charred and all samples scanned unless otherwise noted.
❖ - full sort sample
* - uncharred
a - between 2-10 items
#/#* - both charred and uncharred remains represented

Feature 1 had numerous charred goosefoot seeds as well as a single charred winged pigweed (*Corispermum*) seed and a charred grass seed. Features 2 and 3 also contained some charred goosefoot seeds and Feature 3 had a four charred grass seeds as well. None of the samples had identifiable charred wood fragments. Also, none had any evidence of corn (*Zea mays*), which was found in a possible midden and submitted as a radiocarbon sample. The flotation analysis does not necessarily help in determining what the features were used for. Nonetheless, the presence of charred goosefoot seeds in all three and charred grass seeds in two of the three suggest that both of these natural resources were possibly exploited by the occupants.

5EP1345

Site 5EP1345 consists of a small rock shelter with a midden-like deposit covering the slope in front of the shelter. A single test unit, Test Unit 1, was excavated in the shelter. Radiocarbon samples from two levels excavated in a Test Unit 1 provided calibrated dates of A.D. 795-1030 and A.D. 705-910. Four flotation samples from three ethnostratigraphic layers were analyzed. Three of the samples were fully sorted and one was scanned. The flotation samples from this site provided the greatest diversity and quantity of charred and uncharred remains of the four sites included in this study. These samples also had the highest occurrence of rodent fecal pellets (charred and uncharred) and insect body parts, cocoons, and eggs, indicating a high level of

disturbance in the sampled contexts.

The results of analysis are presented in Table 5. The sample from Layer 3 was the most productive of the four samples. Especially noteworthy was the very high occurrence of goosefoot seeds (358) and the presence of two corn cupules. The remaining three samples also had charred goosefoot seeds in them, with increased occurrence corresponding with the depth of the context. Also, a possible corn glume was recovered from the sample from Layer 2, Level 2. Three of the samples had charred composite and ground cherry seeds. The remainder of the charred seeds were found in only the sample from Layer 3, with the exception of a single prickly pear cactus seed found in Layer 2, Level 2. Other taxa represented by charred seeds in Layer 3 include pigweed (*Amaranthus*), knotweed, chokecherry, and seeds of an indeterminate grass, legume, and mallow (Malvaceae). In many cases, uncharred seeds of the same taxa were also found in Layer 3 or the other layers (see Table 5).

All of the layers and samples contained charred wood fragments of juniper, pinyon, oak, and an unidentified dicot. Also, a small amount of cottonwood (*Populus*) wood was present in two of the samples and a single fragment of mountain mahogany (*Cercocarpus*) was found in one of the samples.

SUMMARY

Some general observations can be made about the macrobotanical assemblages from sites 5PE1610, 5PE1807, 5EP1080 and 5EP1345. As was discussed in the beginning of this report, the charred remains found in the flotation samples are considered to be associated with the occupations of each site. This, however, does not necessarily mean that the charred remains represent exploited resources. There are a number of ways that plant remains can become inadvertently incorporated in a cultural context, such as brought in on clothing or with other gathered resources, than charred and ultimately preserved in the archaeobotanical assemblage. Therefore, a charred condition cannot be used as a positive indicator that the plant represented was a targeted resource. Rather, a charred condition indicates association with the occupation of a site but not necessarily clear evidence of botanical resources intentionally procured by the occupants. Because three of the sites are rock shelters, there is some possibility that some of the uncharred remains are associated with the prehistoric use of the sites. However, without expanded excavations at these protected shelters it is not possible to adequately assess the cultural integrity of the uncharred remains. At this point, only the charred remains can be positively correlated to the occupations. Tables 2-5 and the discussions with each site outline what remains were charred and the various taxa will not be listed again.

Based on the flotation samples analyzed during this study, all four sites have potential to yield archaeobotanical data that could provide data relevant to research themes outlined for the study area. The results of analysis indicate that 5EP1345 has the greatest potential for the recovery of botanical remains. Sites 5PE1601, 5PE1807 and 5EP1080, however, have only moderate

Table 5. Results of Macrobotanical Analysis: 5EP1345

Taxon	Part	Provenience			
		Test Unit 1			
		Layer 1, Lev.3 FS 7	Layer 2, Lev.1 FS 8❖	Layer 2, Lev.2 FS 11❖	Layer 3, Lev.1 FS 15❖
Amaranthus sp.	seed	a*		6*	2/10*
Amelanchier sp.	seed	a*			
Cercocarpus sp.	wood				<0.1g
Chenopodium sp.	seed	b/h*	37/96*	80/180*	358/200*
Compositae	seed	a*	1	3	2
Dicotyledoneae	wood	X	0.2g	0.2g	
Echinocereus sp.	seed	e*	12*	47*	5*
Euphorbia sp.	seed		2*	5*	8*
Gramineae	seed				8
Helianthus sp.	seed	g*	5*	2*	3*
Iva sp.	seed				3
Juniperus sp.	wood seed	X	0.1g	0.4g	0.1g 2/2*
Leguminosae	seed				2
Lithospermum sp.	seed	a*		1*	
Malvaceae	seed				2
Opuntia sp.	seed	a*	5*	1	14*
Physalis sp.	seed	c*	5/85*	6/3*	2/57*
Pinus edulis	wood needle nut/shell cone	X X* 	0.2g 1fg* 1fg*	0.4g	<0.1g 16fg*
Pinus ponderosa	needle	1/X*			
Polygonum sp.	seed	a*			1/3*
Populus sp.	wood			<0.1g	<0.1g
Portulaca sp.	seed		1*	6*	8*
Prunus sp.	seed	a*	1fg*		1

Taxon	Part	Provenience			
		Test Unit 1			
		Layer 1, Lev.3 FS 7	Layer 2, Lev.1 FS 8❖	Layer 2, Lev.2 FS 11❖	Layer 3, Lev.1 FS 15❖
Quercus sp.	wood acorn shell	X b*	0.2g 3fg*	0.5g 1fg*	<0.1g 3fg*
Scrophulariaceae	seed			5*	7*
Zea mays	cupule glume			 1fg	2

Note: All remains are charred and all samples scanned unless otherwise noted.
❖ - full sort sample; * - uncharred; #/#* - both charred and uncharred remains represented
a - between 2-10 items; b - 11-20 items; e - 41-50 items; g - 60-100 items; h - more than 100 items
X - present; fg - fragment(s),

potential for recovery of botanical remains, if the samples analyzed are indicative of the preservation potential of each site. With the exception of 5EP1080, where actual features were excavated, all the samples came from layers/levels believed to be culturally derived, but the functional context of the proveniences could not be defined based on testing. The limited scope of the testing precludes interpreting the botanical remains for the most part. With the exception of the corn from 5EP1345, all of the charred remains recovered could potentially have been
available in the natural habitat of the sites. Some remains, such as chokecherry seeds, would be less likely to be accidental inclusions in the archaeobotanical assemblage, compared to remains like goosefoot or grass seeds. However, without assessing a broader scope within each site, it is premature to interpret the cultural integrity or importance of taxa represented by charred remains, and impossible to evaluate the uncharred remains.

APPENDIX VII

RADIOCARBON ANALYSIS, FCMR

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: est. C13/C12=-25:lab. mult=1)

Laboratory number: **Beta-140323**

Conventional radiocarbon age[1]: **1490±80 BP**

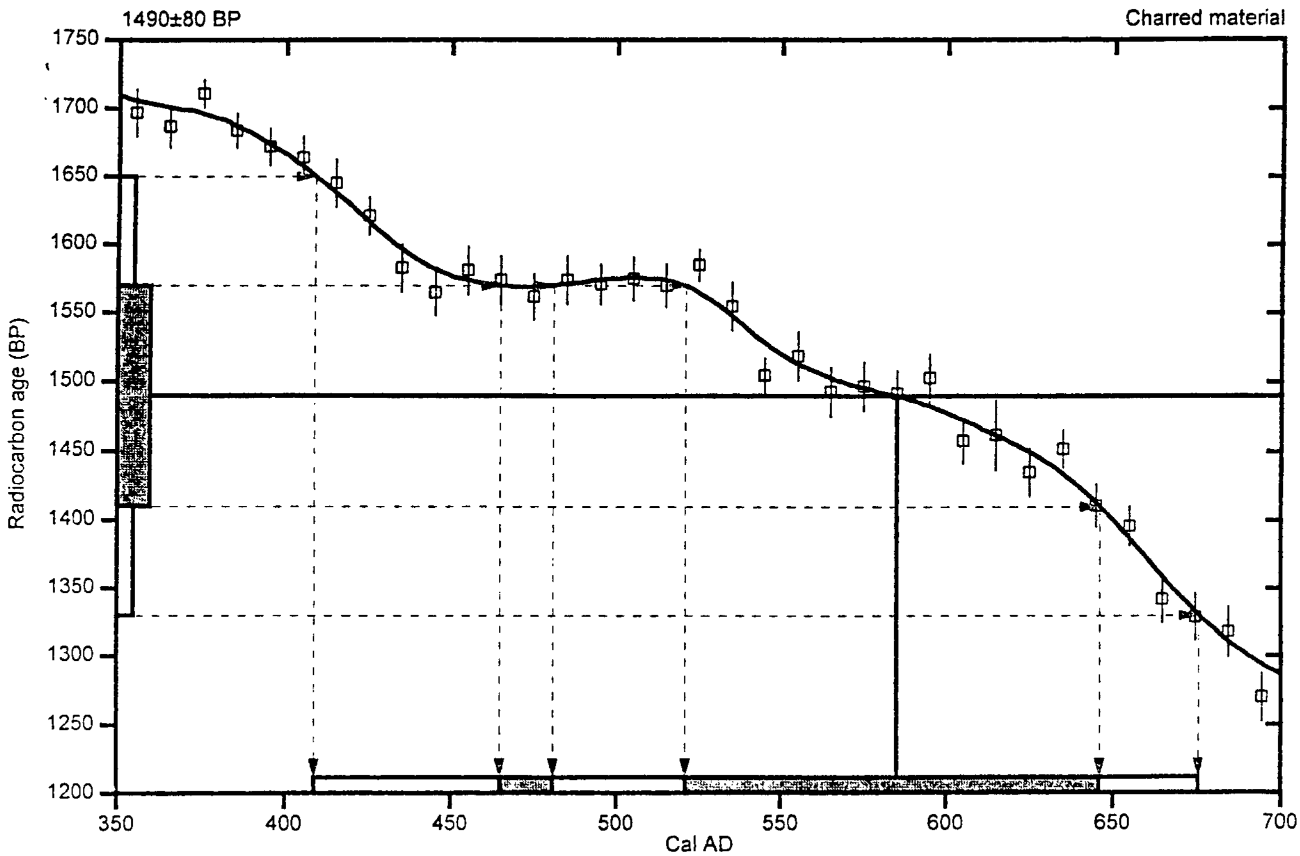
2 Sigma calibrated result: (95% probability) **Cal AD 410 to 675 (Cal BP 1540 to 1275)**

[1] C13/C12 ratio estimated

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 585 (Cal BP 1365)

1 Sigma calibrated results: (68% probability) Cal AD 465 to 480 (Cal BP 1485 to 1470) and Cal AD 520 to 645 (Cal BP 1430 to 1305)



References:

Database used

INTCAL98

Calibration Database

Editorial Comment

Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii

INTCAL98 Radiocarbon Age Calibration

Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: est. C13/C12=-25:lab. mult=1)

Laboratory number: **Beta-140324**

Conventional radiocarbon age[1]: **1570±60 BP**

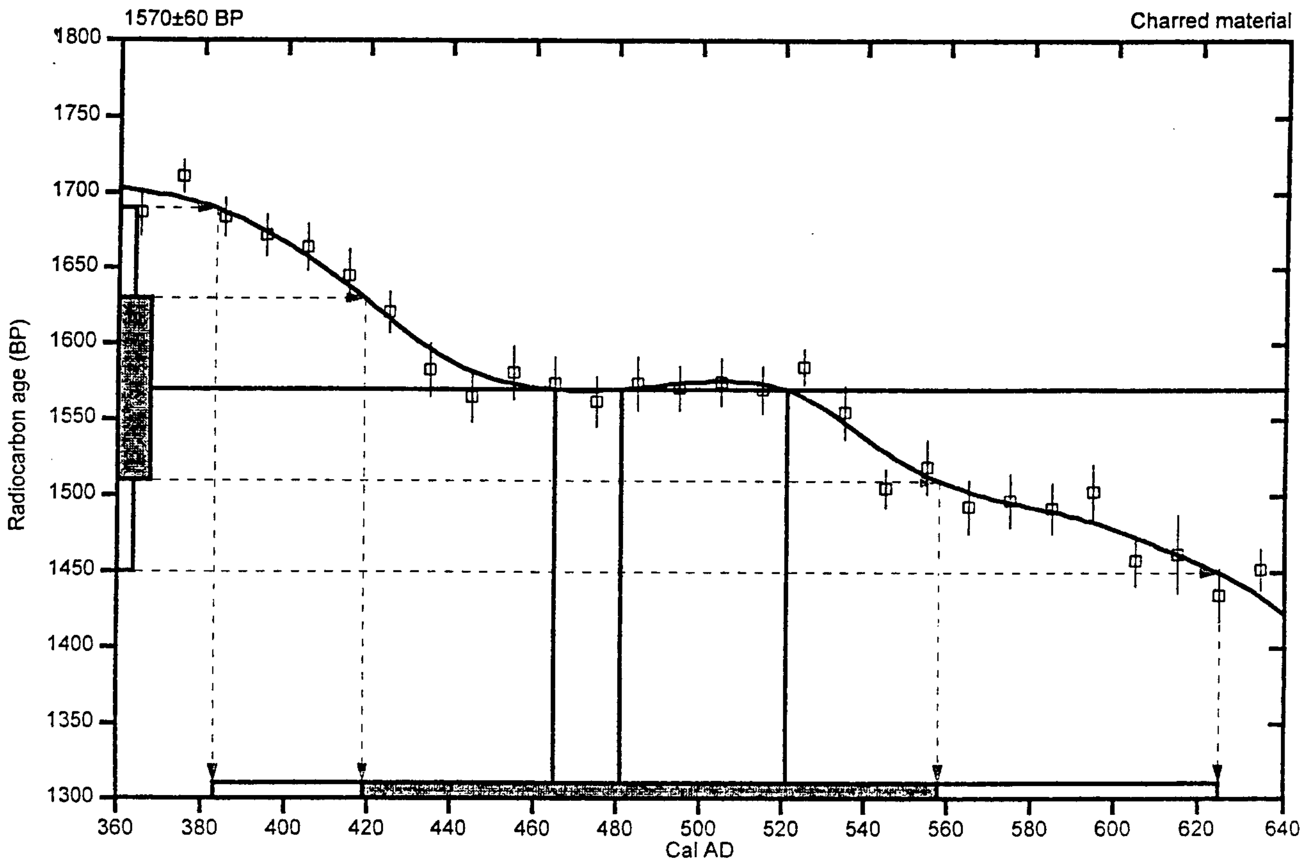
2 Sigma calibrated result: **Cal AD 385 to 625 (Cal BP 1565 to 1325)**
(95% probability)

[1] C13/C12 ratio estimated

Intercept data

Intercepts of radiocarbon age with calibration curve: Cal AD 465 (Cal BP 1485) and
Cal AD 480 (Cal BP 1470) and
Cal AD 520 (Cal BP 1430)

1 Sigma calibrated result: Cal AD 420 to 560 (Cal BP 1530 to 1390)
(68% probability)



References:

Database used
INTCAL98
Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii
INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083
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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: est. C13/C12=-25:lab. mult=1)

Laboratory number: **Beta-140325**

Conventional radiocarbon age[1]: **1200±40 BP**

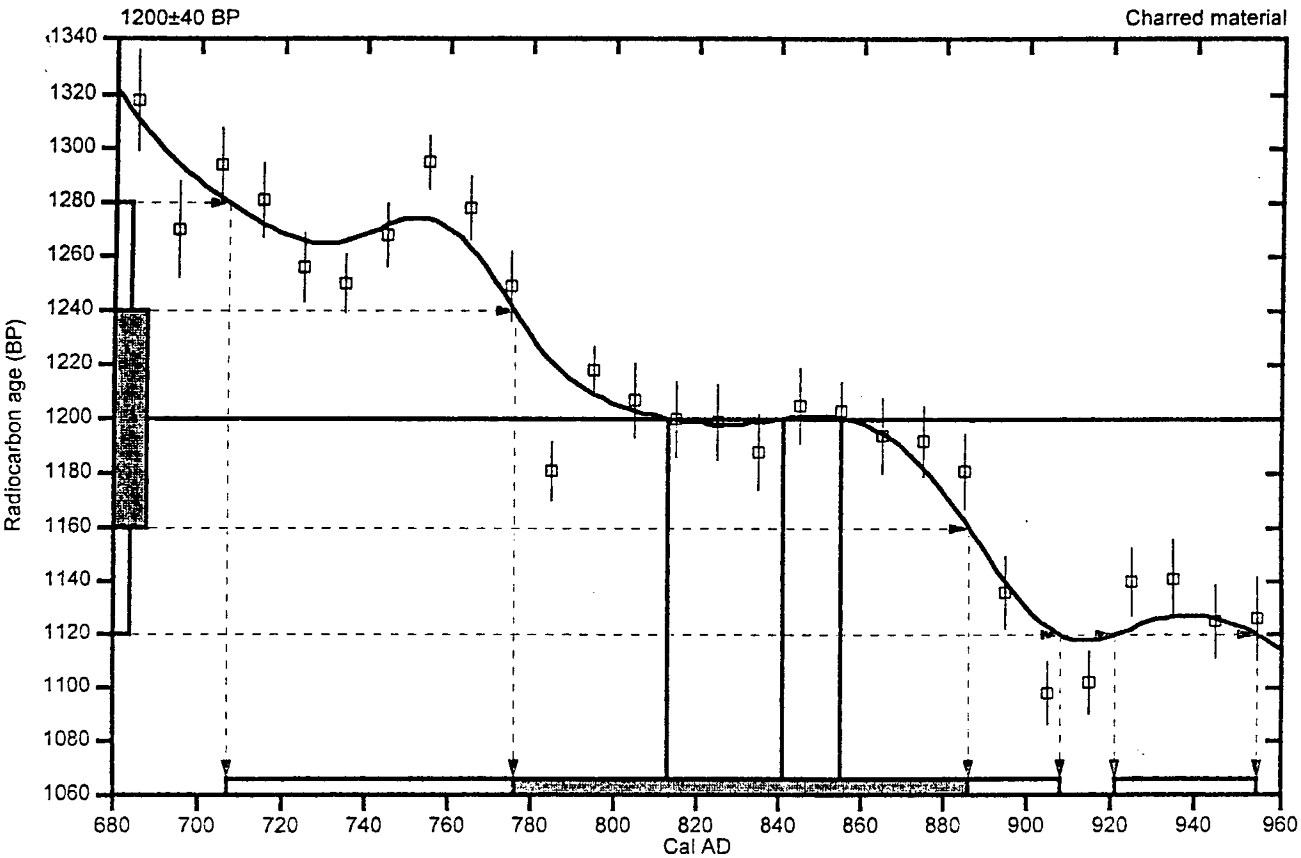
2 Sigma calibrated results: **Cal AD 705 to 910 (Cal BP 1245 to 1040) and**
(95% probability) **Cal AD 920 to 955 (Cal BP 1030 to 995)**

[1] C13/C12 ratio estimated

Intercept data

Intercepts of radiocarbon age with calibration curve: Cal AD 815 (Cal BP 1135) and
Cal AD 840 (Cal BP 1110) and
Cal AD 855 (Cal BP 1095)

1 Sigma calibrated result: Cal AD 775 to 885 (Cal BP 1175 to 1065)
(68% probability)



References:

Database used
INTCAL98
Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii
INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083
Mathematics
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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-8.7:lab. mult=1)

Laboratory number: **Beta-140326**

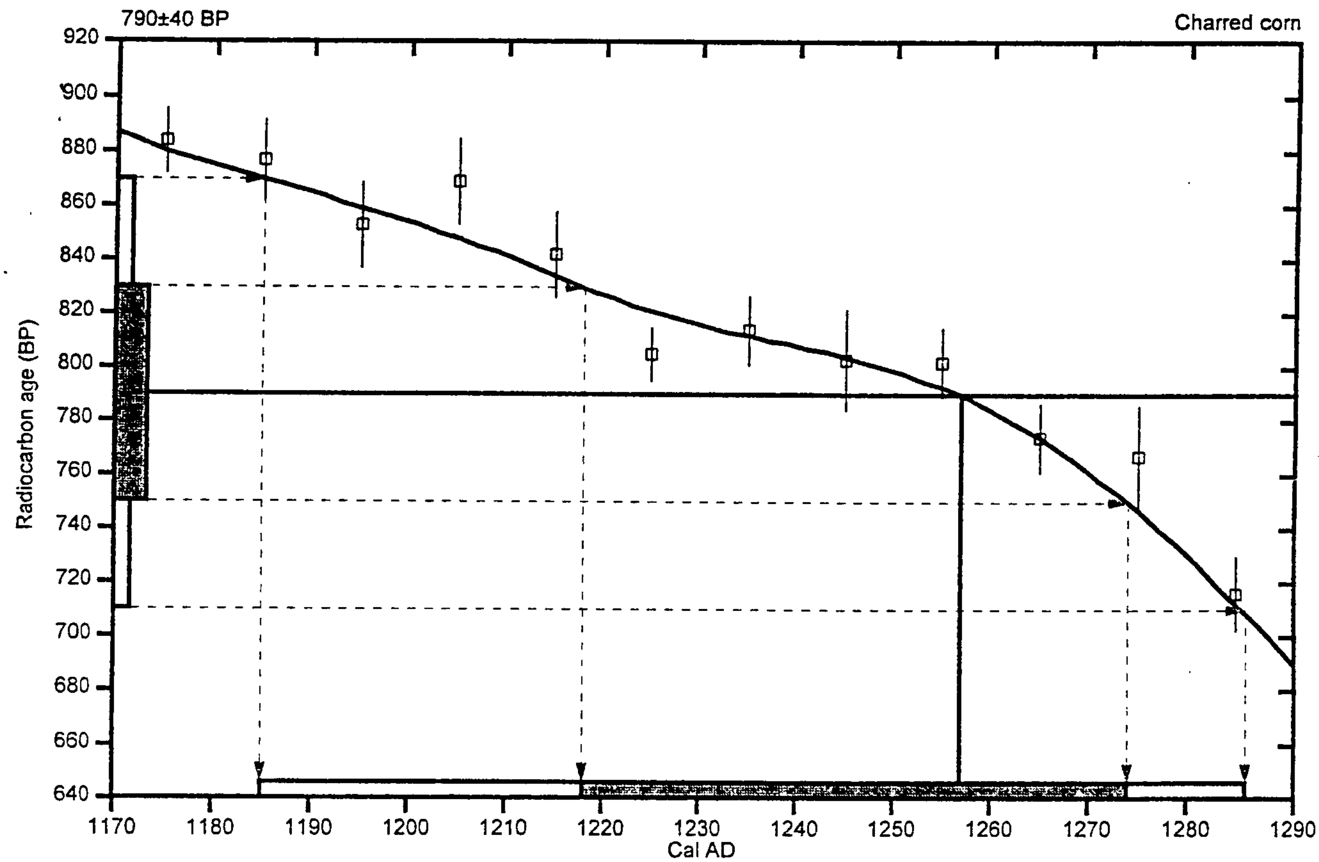
Conventional radiocarbon age: **790±40 BP**

2 Sigma calibrated result: (95% probability) **Cal AD 1185 to 1285 (Cal BP 765 to 665)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 1255 (Cal BP 695)

1 Sigma calibrated result: (68% probability) Cal AD 1220 to 1275 (Cal BP 730 to 675)



References:

Database used

INTCAL98

Calibration Database

Editorial Comment

Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii

INTCAL98 Radiocarbon Age Calibration

Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083

Mathematics

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: est. C13/C12=-25:lab. mult=1)

Laboratory number: **Beta-140327**

Conventional radiocarbon age[1]: **990±100 BP**

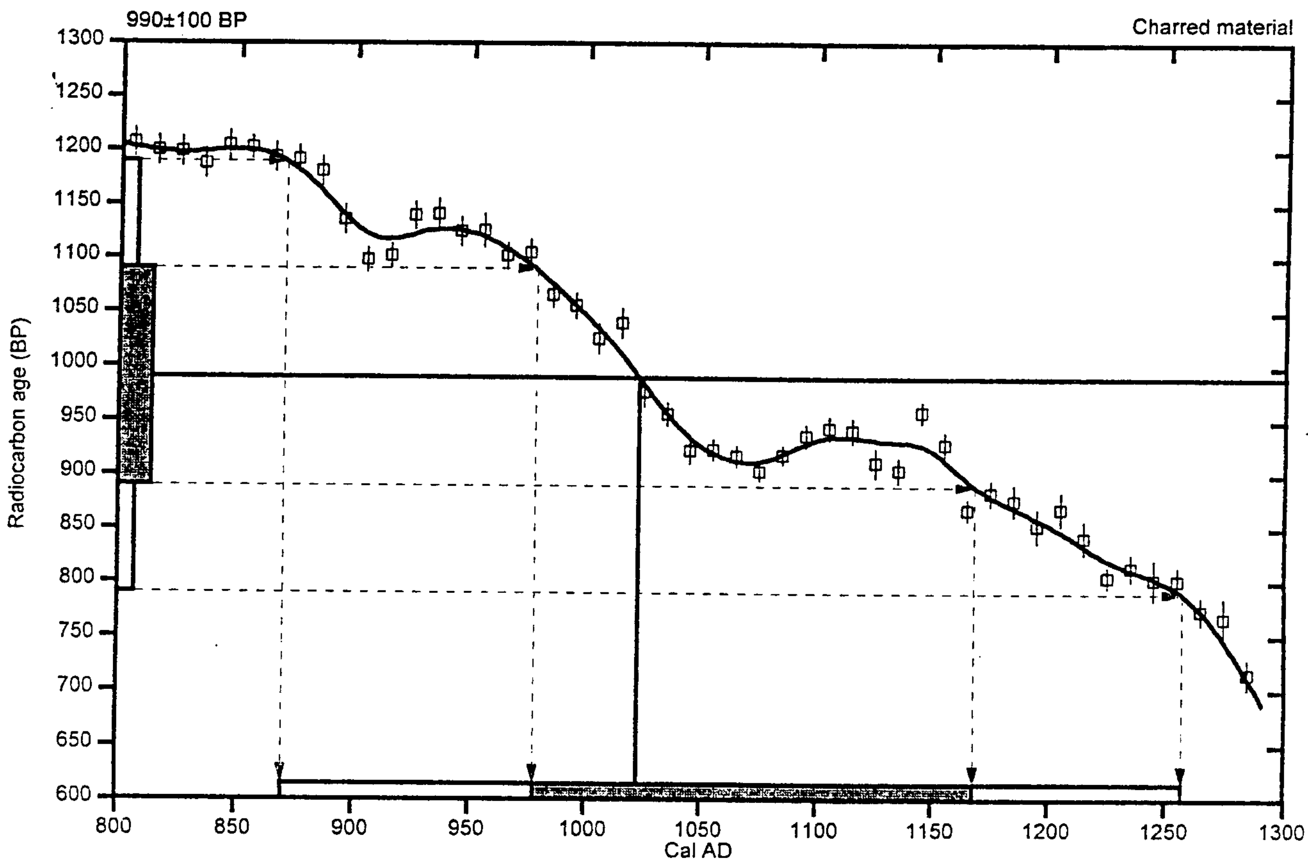
2 Sigma calibrated result: (95% probability) **Cal AD 870 to 1255 (Cal BP 1080 to 695)**

[1] C13/C12 ratio estimated

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 1025 (Cal BP 925)

1 Sigma calibrated result: (68% probability) Cal AD 980 to 1170 (Cal BP 970 to 780)



References:

Database used

INTCAL98

Calibration Database

Editorial Comment

Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii

INTCAL98 Radiocarbon Age Calibration

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: est. C13/C12=-25:lab. mult=1)

Laboratory number: **Beta-140334**

Conventional radiocarbon age[1]: **1090±60 BP**

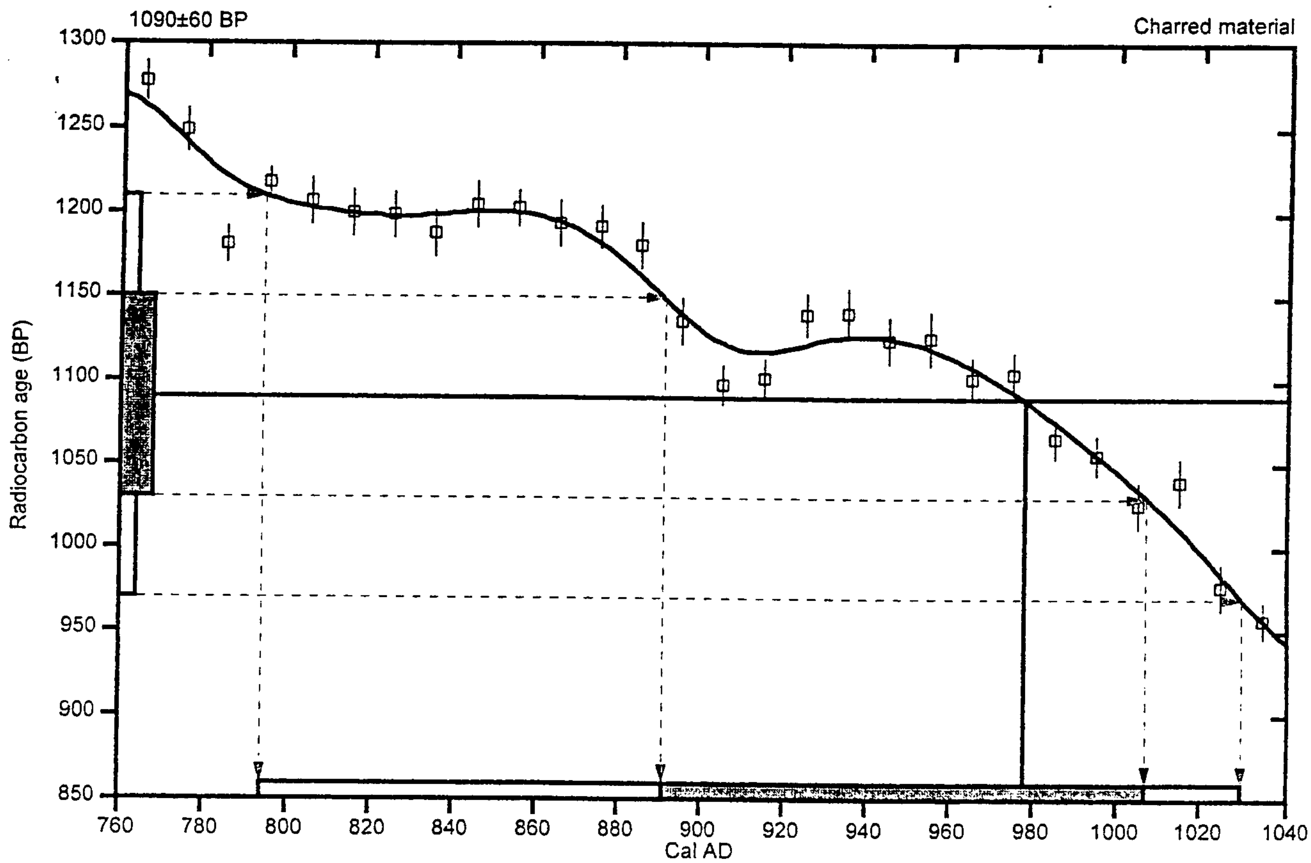
2 Sigma calibrated result: **Cal AD 795 to 1030 (Cal BP 1155 to 920)**
(95% probability)

[1] C13/C12 ratio estimated

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 980 (Cal BP 970)

1 Sigma calibrated result: Cal AD 890 to 1005 (Cal BP 1060 to 945)
(68% probability)



References:

Database used
INTCAL98
Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii
INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083
Mathematics
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: est. C13/C12=-25:lab. mult=1)

Laboratory number: **Beta-140335**

Conventional radiocarbon age[1]: **930±50 BP**

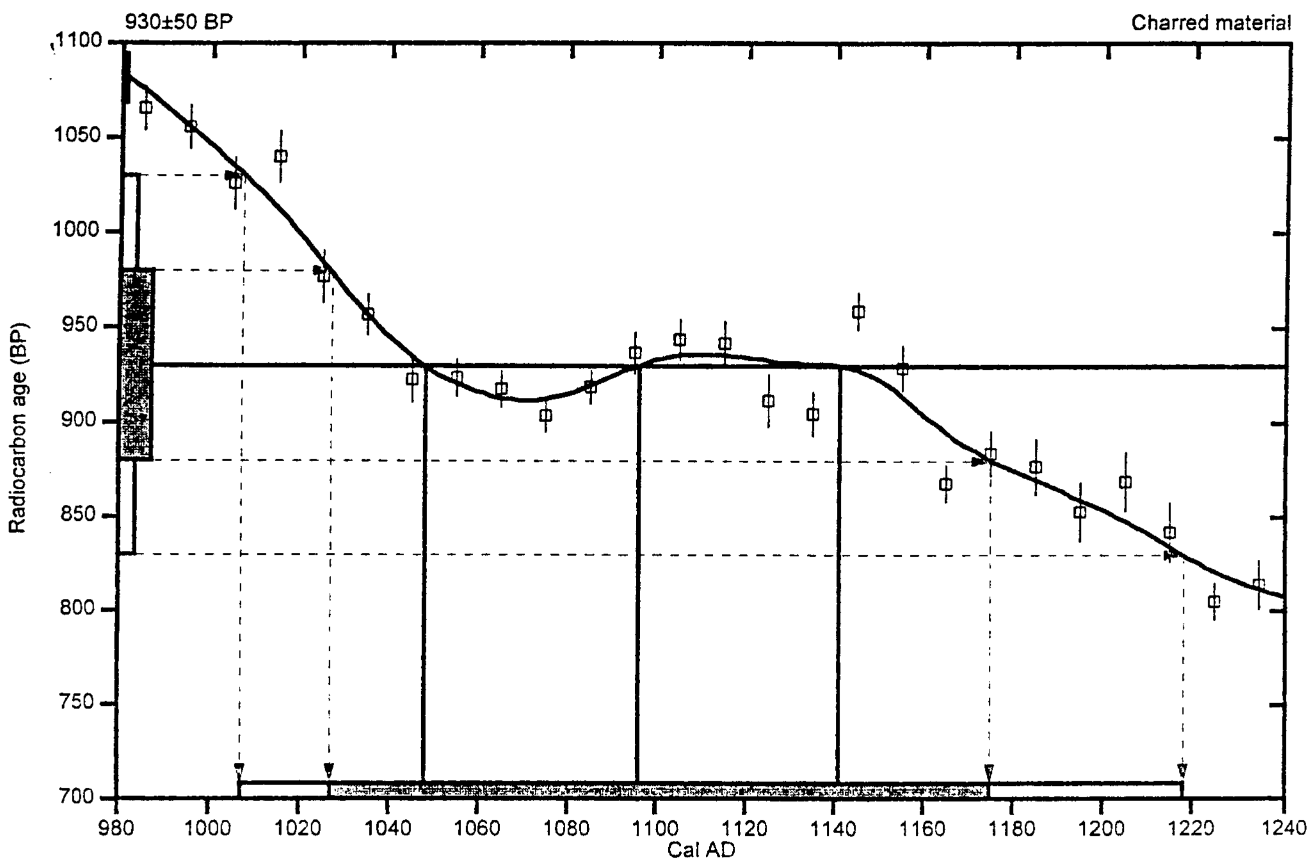
2 Sigma calibrated result: (95% probability) **Cal AD 1005 to 1220 (Cal BP 945 to 730)**

[1] C13/C12 ratio estimated

Intercept data

Intercepts of radiocarbon age with calibration curve: Cal AD 1050 (Cal BP 900) and
Cal AD 1095 (Cal BP 855) and
Cal AD 1140 (Cal BP 810)

1 Sigma calibrated result: (68% probability) Cal AD 1025 to 1175 (Cal BP 925 to 775)



References:

Database used
INTCAL98
Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii
INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083
Mathematics
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